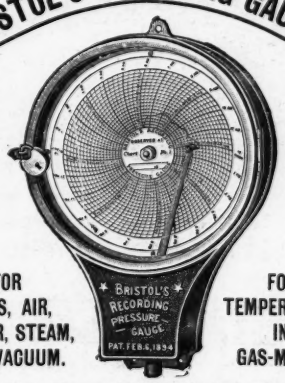
# THE JOURNAL OF GAS LIGHTING
## WATER SUPPLY & SANITARY IMPROVEMENT

VOL. LXXVII. No. 1976.] LONDON, MARCH 26, 1901. [53RD YEAR. PRICE 6d.



NEW IMPROVED
**WEAVING**
FOR
**INCANDESCENT MANTLES.**
The Best, and without Competitors.
**OBERFELT & CO.,**
Berlin, Sandmannshof,
MANUFACTURERS OF MANTLES AND BURNERS.

**THOMAS DUXBURY & CO.,**
16, DEANSGATE, MANCHESTER.
GAS ENGINEERS' AGENTS AND CONTRACTORS FOR
Meters, Fire-Clay Goods, Oxide of Iron, and all other Gas Apparatus. Retort Carbon purchased.
*Inquiries Solicited.*
Telegrams: "DARWINIAN, MANCHESTER."
Telephone 1806.

**BRISTOL'S RECORDING GAUGES**


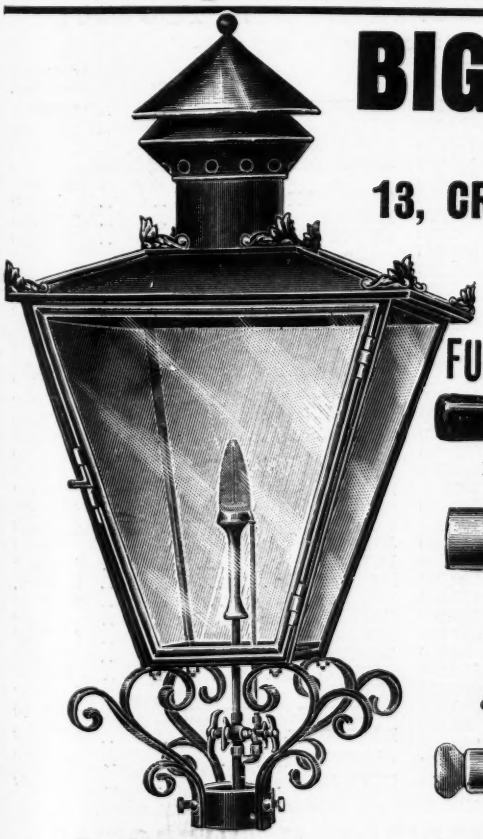
FOR GAS, AIR, WATER, STEAM, OR VACUUM.
FOR TEMPERATURE IN GAS-MAINS.
Many Thousands in Daily Operation.
**J. W. & C. J. PHILLIPS,**
23, COLLEGE HILL,
LONDON, E.C.

— ESTABLISHED 1830. —
**PARKER & LESTER,**
Manufacturers & Contractors.
THE ONLY MAKERS OF
**PATENT ANTIMONY PAINT.**
**Parker's Imperial Black Varnish,**
*Oxide Paints, Oils, and General Stores, for Gas and Water Works.*
WORKS:
ORMSIDE STREET, OLD KENT ROAD,
LONDON.

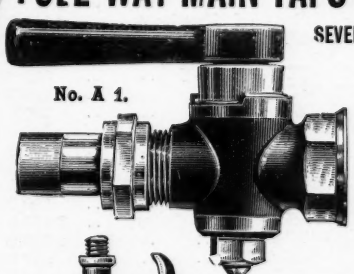
**ROBERT MARSHALL,**
CANNEL COAL MERCHANT,
97, WELLINGTON STREET, GLASGOW.
*Prices and Analysis of all the Scotch Cannels on Application.*

Wrought-Iron

And Fittings and Accessories.
**LAMBERT BROS., WALSALL,**
MANUFACTURERS OF
WROUGHT-IRON TUBES & FITTINGS for GAS, WATER, & STEAM
BRASS GAS-FITTINGS, GAS-VALVES, STEAM & WATER VALVES, TOOLS, &c., AND OF
WARNER'S PATENT MARKET GAS STAND-PIPE.
LONDON: LAMBETH BRASS & IRON CO., Ltd., Short St., LAMBETH


The "DEMAND" REGISTERED *

**BIGGS, WALL, & CO.,**
GAS AND WATER ENGINEERS,
**13, CROSS STREET, FINSBURY PAVEMENT,**
**LONDON, E.C.**
WRITE FOR OUR **PRICE LISTS** OF
**FULL-WAY MAIN TAPS & LANTERN TAPS.**
SEVERAL DESIGNS SHOWN BELOW.
THESE TAPS ARE
**FULL-WAY**
AS SHOWN.
SUPERIOR QUALITY AND FINISH IN GUN METAL.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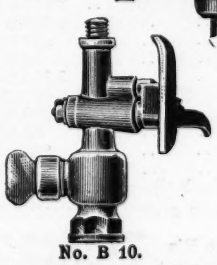
No. A.

**LANTERN TAPS.**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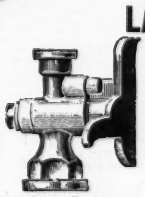
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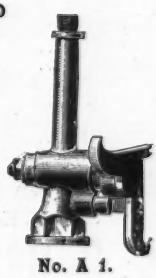
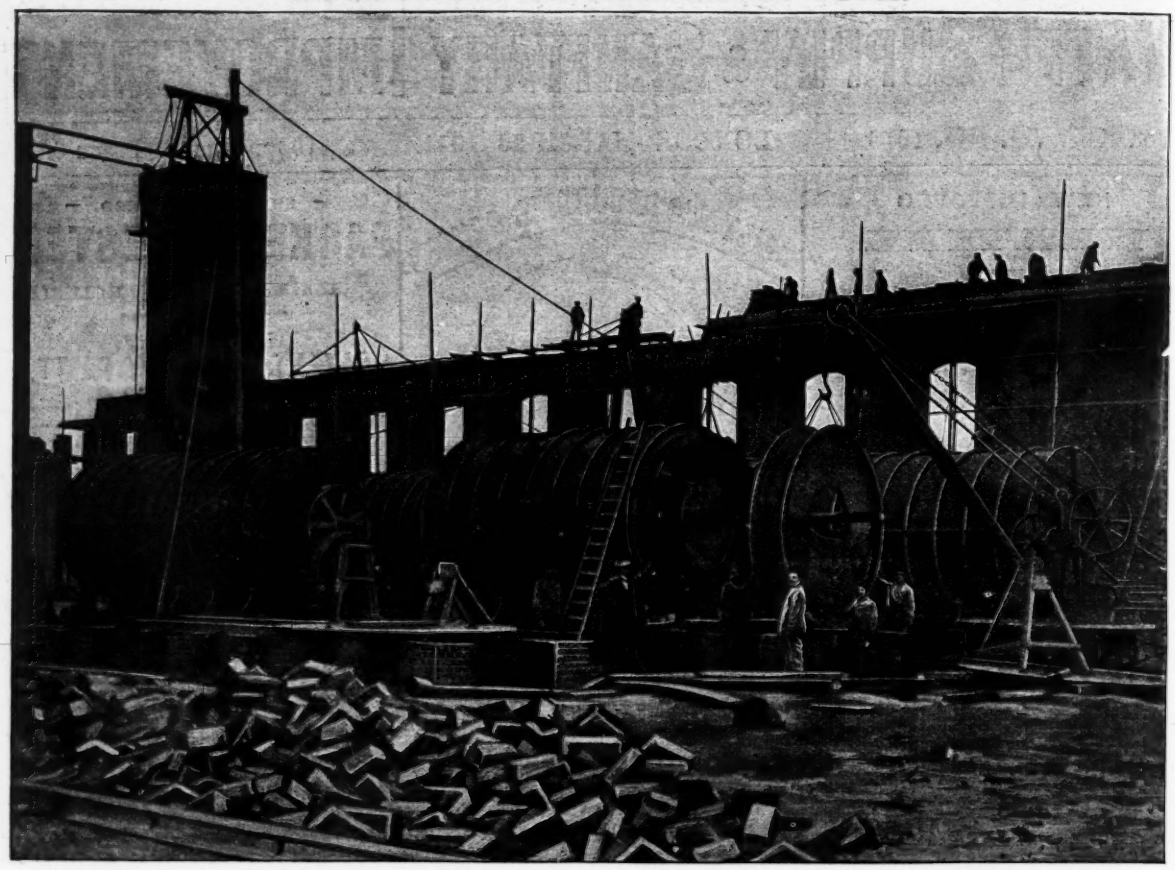

No. A 1.

* Specially constructed for New Incandescent Burner.

# W. C. HOLMES & CO.'S
# PATENT "NEW" SCRUBBER-WASHER
IN VERTICAL OR HORIZONTAL FORM.



VIEW SHOWING BATTERY OF SIX MACHINES IN COURSE OF ERECTION, EACH MACHINE TO DEAL WITH 3,000,000 CUBIC FEET OF GAS PER DIEM.

## SINCE IMPROVEMENTS PATENTED IN 1895-7,

The following Machines have been erected or are now on order:—

| | Cubic Feet Per Diem. |
|---|---|
| KENDAL | 500,000 |
| GLASGOW | 1,250,000 |
| Do. (Four Machines) | 1,250,000 |
| Do. (Four Machines) | 2,000,000 |
| Do. (Four Machines) | 2,000,000 |
| AMSTERDAM | 2,000,000 |
| BRYMBO | 1,250,000 |
| MORPETH | 120,000 |
| SHILDON | 400,000 |
| SUTTON-IN-ASHFIELD | 200,000 |
| CHATTERLEY | 1,500,000 |
| BROUGHTON-SOLVAY | 1,250,000 |
| Do. do. | 1,000,000 |
| KELSO | 200,000 |
| WISHAW | 400,000 |
| WIDNES (Two Machines) | 1,000,000 |
| Do. (Machines) | 1,250,000 |
| WOODSIDE (Two Machines) | 400,000 |
| Do. (Machines) | 500,000 |
| TODMORDEN | 800,000 |
| ABERDEEN | 2,500,000 |
| ECCLESHILL | 250,000 |
| LONGTON | 1,000,000 |
| PAISLEY (Vertical) | 1,500,000 |
| CARLTON IRON CO. | 2,000,000 |
| Do. do. | 2,500,000 |
| TALK-O-TH'-HILL | 2,000,000 |
| CARLTON IRON CO. (3rd Order) | 1,250,000 |
| SHETTLESTON | 500,000 |
| NANTWICH | 250,000 |
| NELSON | 1,500,000 |
| ST. ANDREW'S | 500,000 |
| SANDIACRE | 200,000 |
| JERSEY (Vertical) | 500,000 |
| BARRHEAD | 500,000 |
| MOTHERWELL | 750,000 |
| PADIHAM | 500,000 |
| PERTH (Vertical) | 1,500,000 |
| SEATON CAREW (Four Machines) | 2,000,000 |
| Do. do. (Four Machines) | 2,000,000 |
| Do. do. (Four Machines) | 2,500,000 |
| Do. do. (Four Machines) | 2,500,000 |
| NORTH E. STEEL CO. (Four Machines) | 1,000,000 |
| Do. do. (Four Machines) | 1,000,000 |
| Do. do. (Four Machines) | 1,250,000 |
| Do. do. (Four Machines) | 1,250,000 |
| HURST MILLS | 500,000 |
| THRISLINGTON | 1,000,000 |
| Do. | 1,250,000 |
| SHERINGHAM | 50,000 |
| BRACKLEY COLLIERY | 1,000,000 |
| Do do. | 1,250,000 |
| ORIENTAL GAS CO. (CALCUTTA) | 1,250,000 |
| BANGOR | 1,000,000 |
| CHATTERLEY (Vertical) | 1,000,000 |
| DUDLEY | 750,000 |
| Do. | 750,000 |
| PLEANE COLLIERY | 800,000 |
| AMBLESIDE | 120,000 |
| PRESCOT | 200,000 |
| LLANDUDNO | 500,000 |
| CORK | 1,500,000 |
| BIRMINGHAM | 2,500,000 |
| FARNWORTH | 500,000 |
| FALMOUTH | 500,000 |
| BIRMINGHAM (2nd Order) | 2,500,000 |
| HARROGATE | 1,000,000 |
| HELENSBURGH | 500,000 |
| GARFORTH | 50,000 |
| MANCHESTER | 3,500,000 |
| WEST HARTLEPOOL | 2,000,000 |
| PAIGNTON | 500,000 |
| POCKLINGTON | 50,000 |
| STOURPORT | 200,000 |
| TROON | 120,000 |
| DUMBARTON (Vertical) | 500,000 |
| SALFORD | 2,000,000 |
| FALKIRK (Vertical) | 1,000,000 |
| STOKE-ON-TRENT | 1,000,000 |
| BRACKLEY COLLIERY (2nd Order) | 1,000,000 |
| Do. do. do. | 1,250,000 |
| CATERHAM | 400,000 |
| ILFORD | 2,000,000 |
| SEMET SOLVAY CO. (Six Machines) | 3,000,000 |
| Do. do. (Six Machines) | 3,000,000 |
| Do. do. (Six Machines) | 2,750,000 |
| Do. do. (Six Machines) | 2,750,000 |
| Do. do. (Six Machines) | 2,750,000 |
| ROYAL ARSENAL (WOOLWICH) | 2,000,000 |
| ELLAND | 1,000,000 |
| NORMANTON | 400,000 |
| SUNDERLAND | 2,000,000 |
| BISHOP AUCKLAND | 600,000 |
| TYNEMOUTH | 1,500,000 |
| SELKIRK | 500,000 |
| BEVERLEY | 500,000 |
| HOLMFIRTH | 200,000 |
| COATBRIDGE | 1,000,000 |
| CARLTON IRON CO. (4th Order) | 1,500,000 |
| JOHNSTONE (Vertical) | 500,000 |
| ILKESTON | 1,000,000 |
| HASTINGS | 2,000,000 |
| WALSALL | 1,500,000 |
| JERSEY (Extended) (Vertical) | 250,000 |
| LIMERICK | 1,000,000 |
| DEPTFORD, S.E. | 200,000 |
| DUNOON, N.B. | 300,000 |
| IPSWICH | 2,000,000 |
| ST. ANNES-ON-THE-SEA | 500,000 |
| BLACKPOOL | 2,000,000 |
| CLEETHORPES | 500,000 |
| CONWAY | 250,000 |

NOTE.—*MACHINES IN ALL SIZES can be seen in course of construction at the Works of the Patentees,*

# W. C HOLMES & CO., Contractors to His Majesty's Government, TURNBRIDGE, HUDDERSFIELD.

# THE BARROWFIELD IRON-WORKS, LIMITED,

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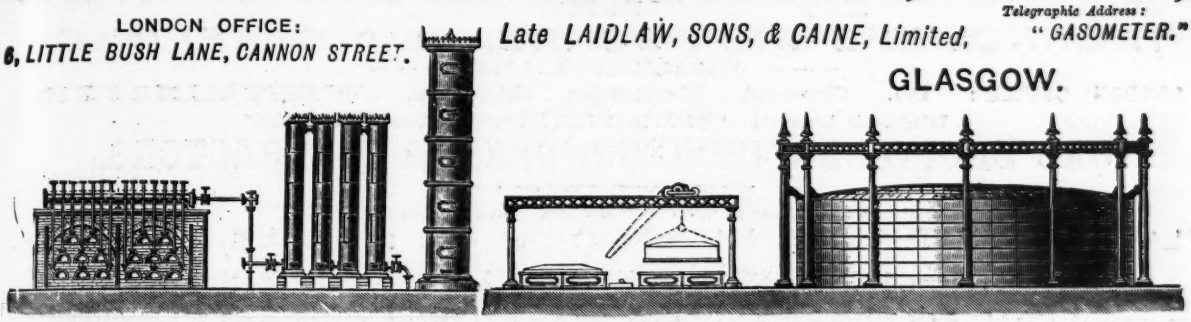
Late LAIDLAW, SONS, & CAINE, Limited,
GLASGOW.

Telegraphic Address:
"GASOMETER."



MANUFACTURERS OF ALL KINDS OF GAS PLANT.

RETORT-BENCH FITTINGS; SIEMENS'S REGENERATIVE AND ORDINARY FURNACES;
CONDENSERS, EXHAUSTERS, AND ENGINES; SCRUBBERS, WASHERS;
PURIFIERS, WITH PLANED AND CEMENT JOINTS;
DRY AND HYDRAULIC CENTRE-VALVES;
HYDRAULIC AND HAND-POWER LIFTING APPARATUS;
GASHOLDERS, SINGLE-LIFT & TELESCOPE; CAST & WROUGHT-IRON TANKS;
STATION METERS; GOVERNORS; SCREW AND RACK VALVES;
FOUR-WAY COCKS AND HYDRAULIC VALVES;
CAST-IRON GAS, WATER, & STEAM PIPES & CONNECTIONS; WROUGHT-IRON TUBES & FITTINGS;
IRON ROOFING, MARKET BUILDINGS, BRIDGES, GIRDERS, STEAM BOILERS;
PROMENADE PIERS AND LOADING WHARVES.

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HENDERSON'S Patent Retorts, Condensers, Stills, Cast and Wrought Iron Tanks, Ammonia Stills, Wrought-Iron Gas-Mains, &c., &c.

DESCRIPTIVE SPECIFICATIONS AND ESTIMATES ON APPLICATION

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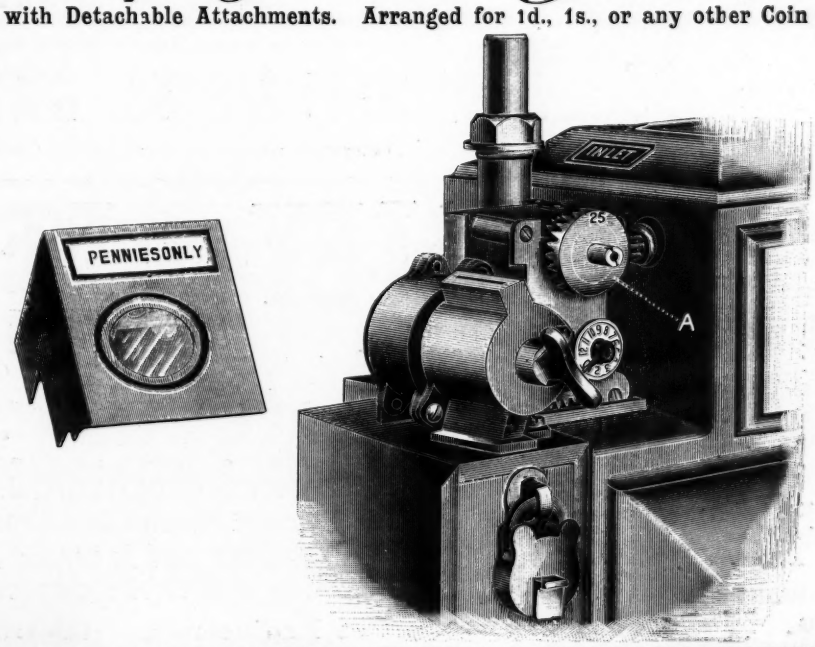
**Atlas Meter Works, PARK STREET, OLDHAM.**

Telegraphic Address: "ORME, OLDHAM." Telephone No. 93, OLDHAM.

**NEW CENTURY PATTERN**

*Patent Coin* *Prepayment Gas-Meters*

Fitted with Detachable Attachments. Arranged for 1d., 1s., or any other Coin desired.




CHANGE OF PRICE EFFECTED BY SIMPLY REMOVING CROWN WHEEL "A" AND REPLACING SAME WITH ANOTHER WHEEL.

# NEWTON, CHAMBERS, & CO.,

LIMITED,

THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD.

Established 1790

LONDON OFFICE: 19, Great George Street, WESTMINSTER.

Telegraphic Addresses: "NEWTON, SHEFFIELD," "ACCOLADE, LONDON."

## GAS ENGINEERS, IRONFOUNDERS, & CONTRACTORS.

Manufacturers of every description of

PLANT, APPARATUS, and MACHINERY for GAS and CHEMICAL WORKS.

RETORTS and FITTINGS, MOUTHPIECES with Self-Sealing Lids.

Improved COAL and COKE HANDLING PLANT, CONVEYORS, and ELEVATORS,

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**PURIFIERS with Planed Joints a Speciality.**

Patent CENTRE-VALVES, RACK and SCREW VALVES, WOOD GRIDS, and SCRUBBER-BOARDS, CAST-IRON MAINS, and SPECIALS.

STRUCTURAL WORK, COLUMNS, GIRDERS, and ROOFING.

GASHOLDERS, Cast-Iron or Steel Tanks.

*DESIGNS, SPECIFICATIONS, and ESTIMATES FREE.*

PIG IRON (Special Quality) for Engine Cylinders. GAS COAL famous for its UNRIVALLED EXCELLENCE.

# THE WIGAN COAL & IRON CO., LIMTD.,

Are exclusive Owners of the well-known HAIGH HALL & KIRKLESS HALL GAS COAL COLLIERIES, and supply the Best Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, Cannel Nuts, &c.

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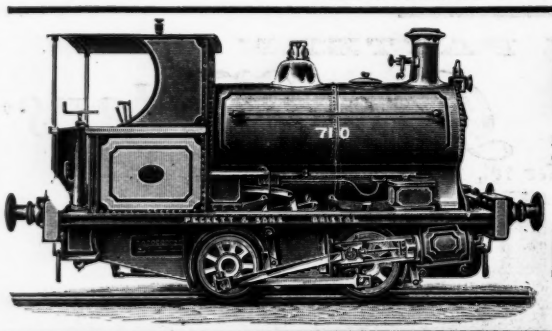
Telegraphic Address: "WIGAN, BIRMINGHAM." Telephone No. 200.

London District Office: 6, STRAND, LONDON—C. PARKER & SON, Sole Agents.

Telegraphic Address: "PARKER, LONDON."



# LOCOMOTIVES

LOCOMOTIVES of all Sizes and Gauges specially constructed for Main and Branch Lines, Contractors, Docks, Gas-Works, Collieries, Iron-Works, Brick and Cement Works, &c. Locomotives of various Sizes always in Stock, ready for Immediate Delivery.

Photographs, Specifications, and Prices on Application.

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# MOBBERLEY & PERRY

STOURBRIDGE.

Manufacture & supply best quality of

Gas Retorts (SEGMENTAL, HORIZONTAL, or INCLINED.)

Special Bricks & Blocks for GENERATOR & REGENERATOR FURNACES.

FIRE BRICKS, LUMPS, & TILES, BLUE STAFFORDSHIRE VITRIFIED BRICKS FOR PAVING, &c., &c.

*EVERY REQUISITE FOR GAS-WORKS. Retort Setters sent to any part of the Kingdom.*

London Agents: Contractors for the erection of Retort-Benches complete.

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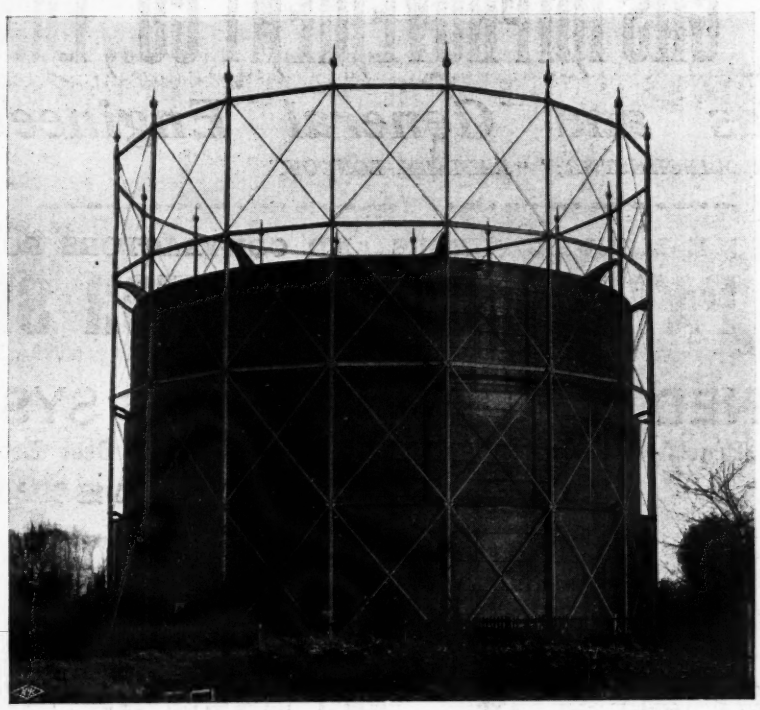
GAS APPARATUS OF EVERY DESCRIPTION.

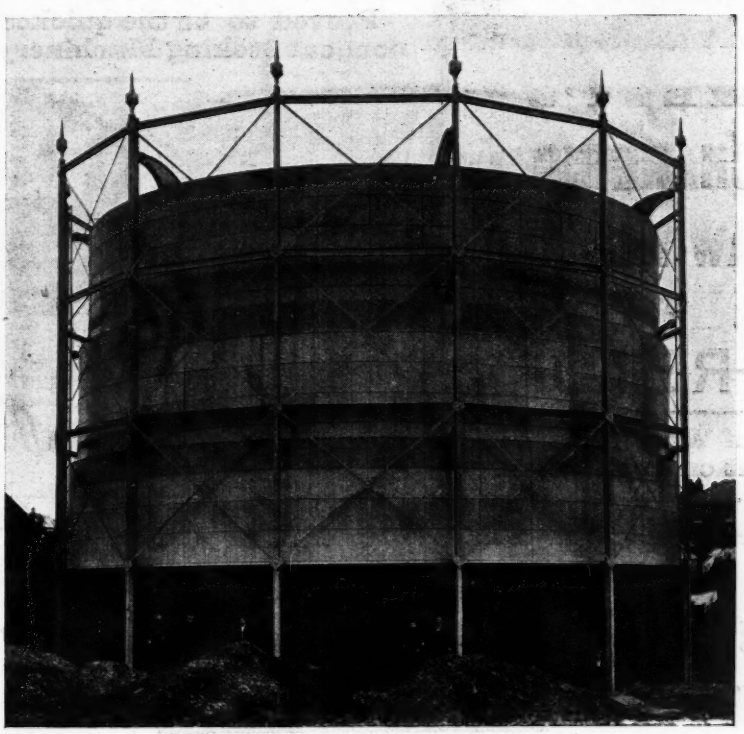
ENGINES, EXHAUSTERS, AND FITTINGS.

Makers of IMPROVED WOOD GRIDS for PURIFIERS with OAK, CANE, or IRON BOLTS.

TYSOE'S SELF-SEALING MOUTHPIECES.



Three-Lift Gasholder and Steel Tank.
90 feet diameter by 20 feet deep.
Recently Erected for the
*EPSOM GAS COMPANY.*



Three-Lift Gasholder and Steel Tank.
72 ft. 6 in. diameter by 14 feet deep.
Recently Erected for the
*WOKINGHAM CORPORATION.*

GASHOLDERS and TANKS.

RETORTS, PURIFIERS, CONDENSERS, SCRUBBERS.

GAS-GOVERNORS, STATION METERS CONSUMERS' METERS, PREPAYMENT METERS.

GAS-FITTINGS.

GAS-COOKERS.

LIVESEY WASHERS, &c., &c.

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Miles Platting,
Manchester.

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# GAS IMPROVEMENT CO., Ld.

And 104,
Queen Victoria St.,
London, E.C.

*Gas and General Engineers.*

*Telegrams: "STOKER, MANCHESTER;" "RADIARY, LONDON."*

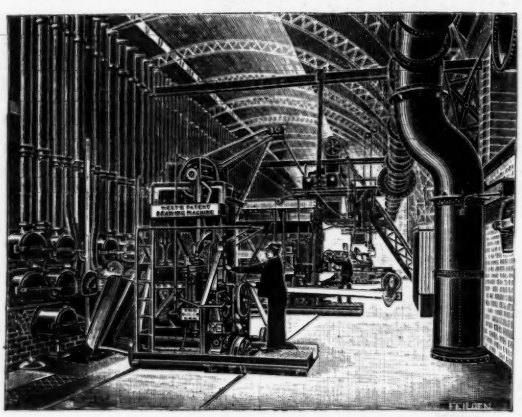
SOLE MANUFACTURERS AND CONTRACTORS FOR

## WEST'S PATENT REGENERATOR SETTINGS

ON THE

## INCLINED OR HORIZONTAL SYSTEMS.

**Constructed on Practical Scientific Principles to produce the Best Economical Results.**



**WEST'S**

## COMPRESSED AIR AND ROPE DRIVEN CHARGING AND DRAWING MACHINERY

**FOR**

## GAS-RETORTS.

**Proved to be the quickest and most Economical Stoking Machinery in the Market.**

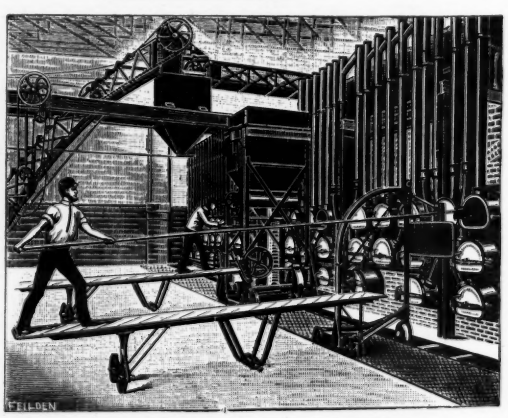
**WEST'S**

## MANUAL CHARGING AND DRAWING MACHINERY

**FOR**

## GAS-RETORTS.

**Extensive list of Works where in operation sent on application.**



**WEST'S PATENT SILENT HOT COKE CONVEYOR.**

*ALSO MANUFACTURERS OF*

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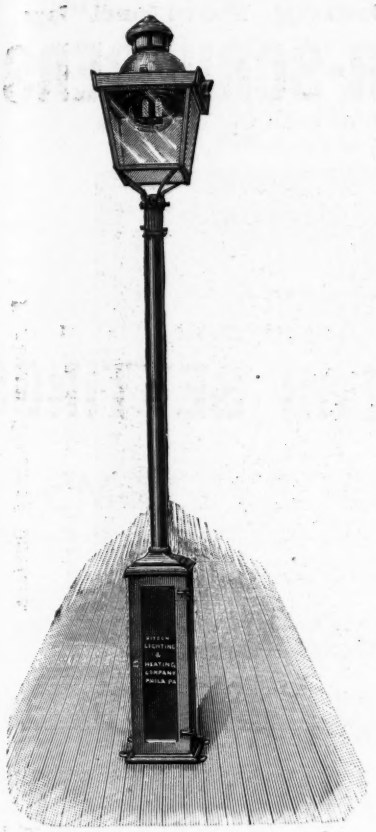
**COAL AND COKE BREAKERS AND SCREENING PLANTS.**

*Air Compressors, Compressed Air Motors. Hauling Capstans.*

**CARBURETTORS FOR ENRICHING COAL GAS**

**AND**

*ALL BRANCHES OF GAS-WORKS PLANT.*



THE

# "KITSON" OIL LIGHT

(VAPORIZED PETROLEUM BURNT WITHIN A MANTLE.)

**1200-Candle Power, 1d. per Hour!!!**

For Streets, Stations, Yards, Factories, &c., &c.

**A System of Lighting surpassing all others in respect of**

## EFFICIENCY AND ECONOMY.

*Self-contained Lamp-Posts.*

*No tearing up of the Thoroughfares.*

**See Professor Lewes and Dr. Boverton Redwood's Joint Report.**

("JOURNAL," *Feb. 5, p.* 338.)

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BLACKFRIARS, LONDON, E.C.

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## ENGINEERS & IRONFOUNDERS,

**CAST-IRON PIPES**

**ALL SIZES.**

MANUFACTURERS OF

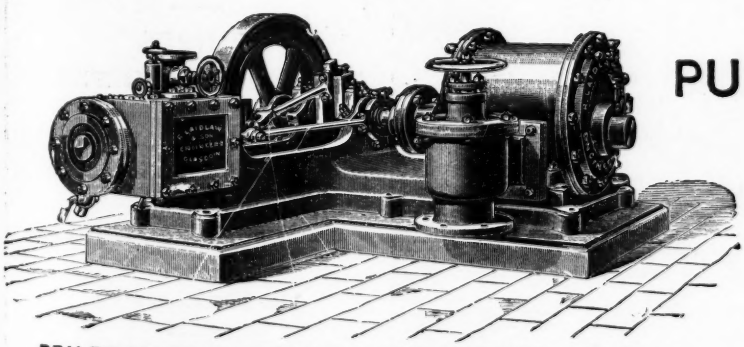
STEAM-ENGINES,

EXHAUSTERS,

VALVES,

AND

PUMPING-ENGINES.



BEALE'S GAS EXHAUSTER AND ENGINE COMBINED. ALL SIZES.

ALL KINDS OF

GAS AND WATER APPARATUS.

ALLIANCE FOUNDRY, GLASGOW. | SIMON SQUARE WORKS, EDINBURGH. | 6, LITTLE BUSH LANE, LONDON, E.C.

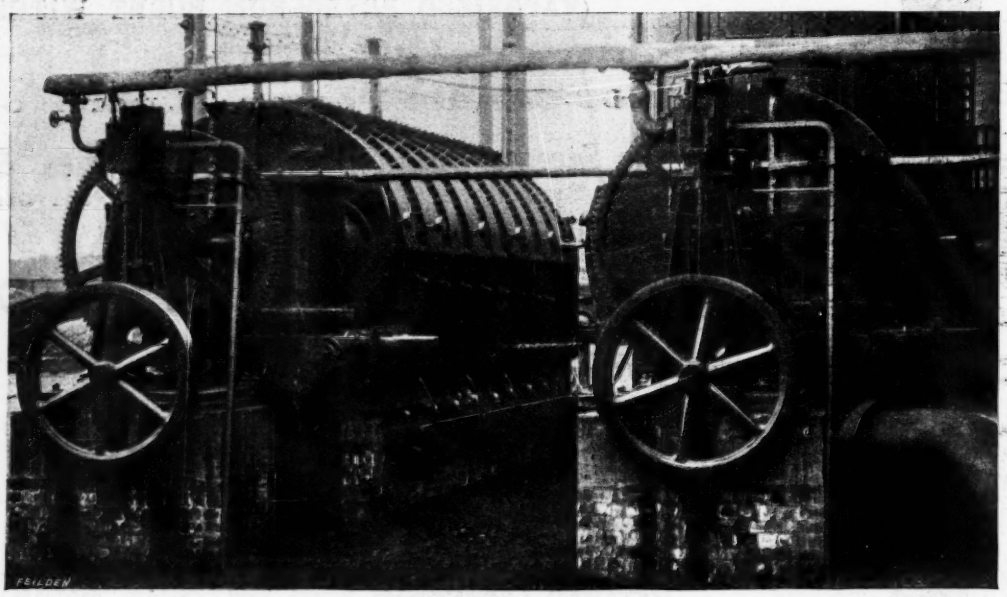
# 642,000,000

**Cubic Feet of Gas per day are now being Purified by**

# PATENT "STANDARD" WASHER-SCRUBBERS

**which extract ALL the Ammonia and a large proportion of the $CO_2$ and $H_2S$.**

[Prevention of Slip of Gas Unwashed.
Strength of Liquor Concentrated.



Maximum Washing Surface.
Easy access to interior.

## KIRKHAM, HULETT, & CHANDLER, LD.

**PALACE CHAMBERS, BRIDGE ST., WESTMINSTER, S.W.**

Telephone No. 103. Telegraphic Address: "ELEVATOR, HASLINGDEN."

# S. S. STOTT & CO.,

**ENGINEERS, HASLINGDEN, NR. MANCHESTER.**

**COAL AND COKE ELEVATORS & CONVEYORS.**

**COAL AND COKE STORAGE PLANTS.**

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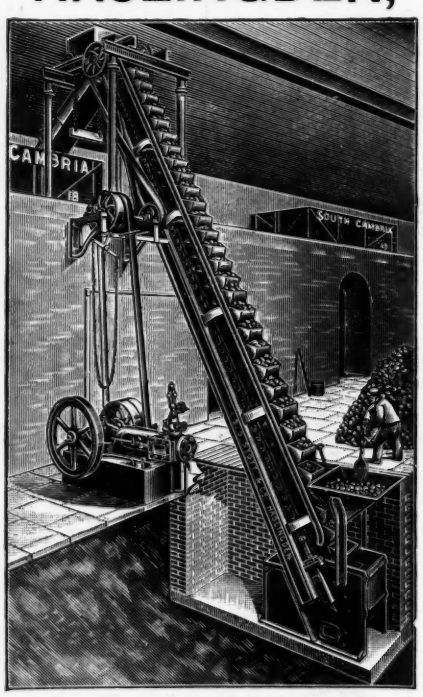


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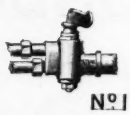

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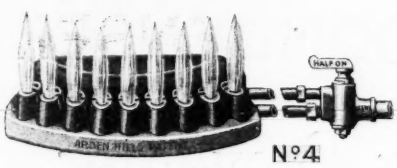


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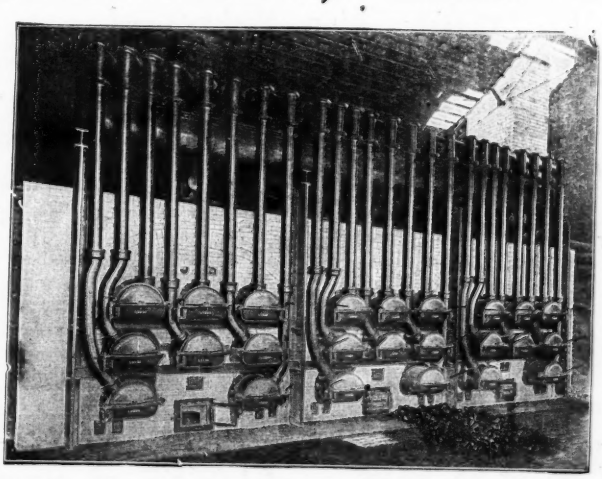

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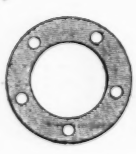

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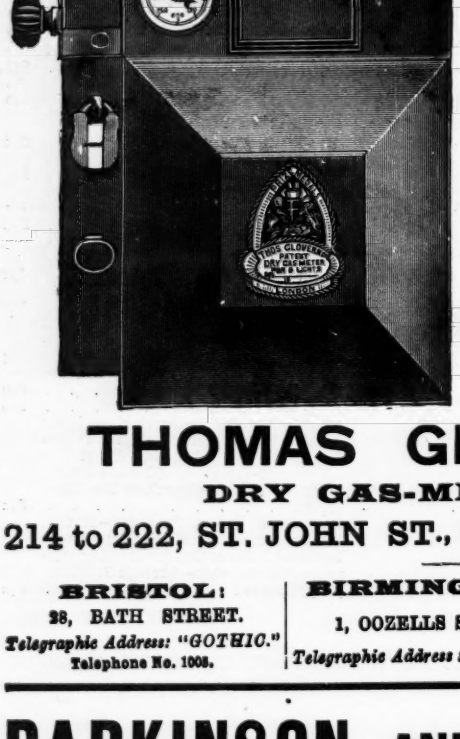

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# JOURNAL OF GAS LIGHTING, WATER SUPPLY, &c.

VOL. LXXVII., No. 1976.——TUESDAY, MARCH 26, 1901.

## EDITORIAL NOTES.

### Cheaper Coal for the Railways.

THE news of the terms upon which the railway companies whose coal contracts expire at the end of this month have been able to renew their contracts, is indeed welcome to all prospective buyers of coal. Nothing, in fact, could more clearly justify the policy of caution which has been so persistently advocated in these columns during the past winter. At the end of December last, it was announced that the collieries, after offering the railway companies a reduction of 1s. per ton from the then contract price of about 16s., had conceded 2s. 6d. per ton, and that the companies had closed with the offer—some for three, some for six months. We then ventured to express the earnest hope that industrial consumers of coal generally would not look on these sales as representing the best terms that would be on offer, or obtainable, during 1901, and that buyers would not create an "inevitable" by accepting it.

That much better terms would be offered, and still better be obtainable, there seemed every reason to believe; and events have fully borne out the expectation. Those companies who refused to commit themselves beyond the end of March, are now reported to have obtained contracts for the ensuing nine months' supplies at 9s. per ton—a reduction of 4s. 6d. since the end of December, and of 7s. compared with last summer's price. In other words, locomotive coal is now being bought at a lower rate than it was before the extra 5s. was clapped on last year, to the dismay of the railway shareholder and the demoralizing of the house coal market. The Yorkshire collieries, we understand, tendered at 10s. to 10s. 6d. per ton, but have accepted 9s.; while Derbyshire owners have sold at 8s. 6d.

In the paragraph that has gone the round of many of the papers, it has been stated that "several companies, however, "have contracted to the end of June at 13s. 6d." This has appeared mysterious to some people, and particularly to some of the journals that have reproduced it; but the explanation is simple enough. What the news agency should have reported was that "several companies, however, had "already (three months ago) contracted to the end of June "at 13s. 6d." But then, since our news-distributors have to inform us upon so many matters of which they are themselves profoundly ignorant, we must be thankful when the information given proves approximately correct.

The reports of these railway coal contracts seem to have completely upset the equanimity of the miners' leaders. Mr. B. Pickard, M.P., the President of the Miners' Federation, speaking at Barnsley yesterday week, was very indignant. "It was ridiculous," he said, "that the owners should be "browbeaten by the railway companies asking for an ex-"treme reduction, while the general public had not had a "reduction of a penny. In Barnsley, it still costs 20s. a "ton or more to put the coal into the cellars." Well, that really seems an argument rather in favour of lowering the price of "households" (which, it may be remarked, are now on the down grade) than of keeping up that of engine coal, and merely points to the fact that railway companies are less easy to deceive as to the true state of the market than is the general public. Mr. Pickard speaks as though the owners were reducing their prices to spite the miner, who will in consequence have to put up with lower wages. To say that, "in some localities the owners were *desirous* of reducing the "value of coal," hardly seems a faithful description of the situation.

Of course, this is all mere bluff on the part of Mr. Pickard. He knows as well as we do that collieries do not lower prices except under pressure of actual necessity; and he knows equally well that that necessity exists. But to say so would not suit the book of one who will be expected to oppose, with all his might, the consequent reduction of wages; and that his speech was intended merely to preface that opposition, is clearly shown by his remark that "to "rush down coal now appeared to be one of the fatal pranks "colliery owners were subject to. But after such dividends, "it would be a most unseemly act to ask for any lowering "of wages for a long time to come." This is simply an attempt to enlist the sympathy of the public for the poor miner oppressed by the "capitalist" owner; for Mr. Pickard knows, from past experience, what an appetite the general public has for clap-trap, and how extensive is its ignorance of the actual facts concerning coal supplies, prices, and miners' wages. Otherwise he would not have remarked that "they were being continually taunted that the men "would not work; but he found that Yorkshire last year "produced 28 million tons of coal, against 26 millions in "1899." The accurate figures, it may first be pointed out, were 28,243,500 tons in 1900, against 26,901,000 tons in 1899, which somewhat modify those given by Mr. Pickard; but what actually turns the point of the statistics against his argument, is the fact that, while the increase in the output represents the year's work of about 4500 men, the number of miners employed in the district was nearly 6000 higher last year than in 1899. In other words, the output per man in Yorkshire fell off last year, and was indeed less than the average for the kingdom. Yet Mr. Pickard tries to blind the public to the truth by comparing only the total output of the district for the past two years, and disregarding the number of men employed.

We do not, however, think that the miners will succeed (as they did in 1893) in enlisting public sympathy on their side, should they be so foolish as to resist, to the point of a strike, the inevitable reduction in wages. The abnormal earnings of the men, as well as the splendid profits of the masters, during the past year or eighteen months are matters of common knowledge; and the consumer of coal who has been paying so smartly to provide those earnings and profits will have scant sympathy with the aggressive party in the event of a strike, designed to perpetuate the increased price of coal. And it has been patent for some time past that the men were decidedly on the aggressive. Apart, however, from this aspect of the question, the outlook for the coal buyer is distinctly encouraging.

### The Condition of London Gas Affairs.

THE news that the ordinary stock of the Gaslight and Coke Company fell about 5 per cent. in market value last week, is a sufficient indication of the light in which the incident of the loss of the Company's Bill is regarded by the financial world. Not a ripple, of course, on the surface of the current of affairs betrays the feeling of the Horseferry Road; but outsiders are wondering mildly whether the responsible heads of this great establishment retain in all its fulness the supreme self-satisfaction which they habitually display on all the public occasions when they appear before the world. Probably they do. They have put the price of gas up to a figure which must before long give the Company any amount of surplus profit to add to the moveable reserve fund; and who shall say they are not entitled to take what advantage they can find in the existing situation of the undertaking? On the face of it, there does not appear to be any real reason for the drop in the ordinary stock; and the public will begin buying again as soon as they realize the true position of the Company's affairs. What is depressing the market price is, perhaps, the uncomfortable feeling that the Company are engaged in a struggle with Parliament in which they are bound to be worsted in the long run; while the exact character of the penalty to be exacted for the wrong-headedness of the Administration remains a mystery.

As we anticipated, the contemptuous treatment meted out to the Gaslight and Coke Company's parliamentary aspirations is reflecting on the South Metropolitan Bill, which was read a second time on the 6th inst. It has been asserted by Mr. E. H. Pickersgill that the latter Bill would have the effect of giving, by a side-wind, the capital powers which have been refused by Parliament to the Gaslight and Coke Company. This result would only follow if the suggested sale of the Nine Elms property were carried out, and not then to the extent foreshadowed in the estimate published by the London County Council. But the transfer is to be opposed with all the strength of the Middlesex portion of London, on the score of the sacrifice which it would entail of the advantage at present enjoyed by the Public Authorities, who get their gas for street lighting at the South Metropolitan

price. It is true that an attempt has been made by the promoters of the South Metropolitan Bill to meet this difficulty. A clause has been drafted, and will be submitted in Committee, to the effect that the price of gas supplied for public lighting north of the Thames shall never exceed 2s. 8d. per 1000 cubic feet—the present price—unless the South Metropolitan Company should themselves charge more, when all the existing condition would again prevail. This is a compromise that the London County Council, who do not buy much gas for street lighting, might conceivably accept in the major interest of the population concerned. It is obviously unfair to the private consumer for the gas required for public lighting to be priced at too low a figure; for he has to make it good. On the other hand, the Highway Authorities who actually do the street lighting will probably regard the matter differently. Apart from this detail, however, the objection taken to the South Metropolitan Bill by Mr. Pickersgill is a sufficiently serious one. It is that, although the Powers of Charge Committee did undoubtedly recommend the transfer of the southern area supplied by the Gaslight and Coke Company to the South Metropolitan Company, this recommendation was but one of a series which should be read together. He even approves of the idea of the transfer, in itself, but subject to its being included in a complete scheme of settlement of the Gas Question of London. Standing alone, the transfer is a very different thing, and if permitted would indefinitely postpone the realization of the other points of the programme. It remains to be seen how far Mr. Pickersgill's views are shared by the opponents of the South Metropolitan Bill when it gets into Committee.

Supposing this Bill to be lost—what then? There is, of course, a possibility of its being passed *minus* the transfer clause. The South Metropolitan Company would be quite justified in taking as much as Parliament chooses to give them, by way of *solatium* for the expense and trouble of promoting another Bill. We notice that one of the London newspapers denounces this promotion as a "gas manœuvre," and refers to the Bill as being "nominally promoted in the "interest of the South Metropolitan Company." This is arrant nonsense, if the language used is to be interpreted to mean that the wires of this movement are being pulled by the Gaslight and Coke Company. Regular readers of the "JOURNAL" do not need to be told that, to say the least, the South Metropolitan Company are not likely to act in any way except to gain their own proper and legitimate ends. The acquisition of the southern area of the Gaslight and Coke Company is not a mere sentimental question for them. It would obviously be to their advantage to be in undivided possession of the whole of the central district which is bounded by the River Thames on the north, and by the Suburban Gas Companies on all other sides. Moreover, the population of Southern London is increasing most rapidly at two parts—one in the south-eastern region beyond Peckham, and the other centering in Clapham Junction. The supply of the "hinterland" of the Junction from the East Greenwich station is already pretty much of a tax. The gas has to be sent into this region by assisted pressure, which will speedily become the rule, rather than the exception, for the Company's trunk mains. Notwithstanding all that is said concerning the possibilities of this principle of gas transmission, unquestionably the exigencies of supply dictate a reasonable multiplication and localization of works. We cannot calculate the precise comparative cost of sending gas from East Greenwich up to Clapham Junction, and barging coal to Nine Elms as the first stage, and completing the supply of gas from this manufacturing centre. But the Nine Elms works would prove useful to the Company, which is sufficient reason for their being willing to buy them—at a price.

We merely put forward these suggestions as constituting ample justification for the South Metropolitan Company's present action in seeking powers to enable them to play their part in regard to the only recommendation of the Powers of Charge Committee which, so far as they are concerned, remains outstanding. Parliament may either deny the Company these facilities or surround the grant of them with all sorts of conditions. It must not be forgotten, however, that there is a barrier to the inclusion in the South Metropolitan Bill of anything affecting the Gaslight and Coke Company, who are not parties to the measure. Altogether, therefore, the London Gas Question is in a remarkable stage just now; and future developments will be awaited with curiosity.

## The Need of Science in Business.

LORD ROSEBERY continues to avail himself of every opportunity to urge upon the country the need of putting its house in order against the time of increasing competition in commerce which lies before it, and to call attention to the important place that the training of the rising generation should occupy in the minds of those who are in a position to influence the destinies of the nation. His latest discourse upon the subject was delivered on Thursday last, at a meeting convened at the Mansion House by the Governors of the London School of Economics, the object of which school was defined by the Lord Mayor as being "to provide a "scientific training in the structure and organization of "modern industry and commerce, and the general causes "and criteria of prosperity."

This school has been in existence for some time; and it is now hoped to extend its usefulness, as new and more commodious buildings are in process of construction. That it has proved already of considerable practical value may be considered pretty conclusively established by the fact that our friends the Germans have been so much struck by its usefulness that they have promptly founded a similar school in their own country. The principal courses—designed to teach, "not the ordinary subjects of secondary schools, but "the larger principles and the larger policy which underlie, "and must direct, all great business transactions in this "age of the world"—were enumerated by Lord Rosebery. There are courses (by practical men) on foreign trade, chartered companies, the economics of machinery, the policy of different states in relation to means of transport, the principles of banking and currency, commercial geography, on markets and dealing, and so forth. A special course, "to which they attach the highest importance, and which "is numerously and influentially attended," is given on the railway systems and policies throughout the world.

Are there not among these courses several that might with advantage be attended by the younger men in the gas world? The economics of machinery—have our engineers nothing to learn there? Markets and dealing—how many of our managers have a scientific knowledge of the markets in which they have to buy and sell? We venture to say that the art of buying and selling is studied, and the knowledge necessary to its successful practice is acquired, by the average gas manager, only in the most perfunctory and unsatisfactory fashion. Of course, anybody can buy or sell on the principle of asking the other party his price, and then offering to give sixpence less, or to take sixpence more, than the figure which the other man names; but the scientific and expert bargainer is he who knows, as closely as can be ascertained, the true market price of the article he wants to buy or sell, and obtains the one for less rather than more, and who sells the other for more rather than less, than that market price. Now, the gas manager has to make purchases and sales of great importance in markets—the coal, iron, and other materials, the coke and other residuals, markets—which are constantly fluctuating, and which require the most intimate knowledge and the most careful handling in order to obtain the best results. How many of the men who are entrusted with that responsibility have had any specific training for the work?

Mr. G. S. Gibb (the General Manager of the North-Eastern Railway), in a telegram excusing his absence from the Mansion House meeting, said: "English railway ad-"ministration must more and more adopt methods based "on the study of principles, and must make strong efforts "to secure better provision of scientific training for the traffic "staff." Alter "railway" to "gas-works," and strike out the word "traffic," and these sentences will receive the endorsement of those who best understand the present-day needs of the gas industry. We want more highly-skilled staff officers. Spirit and energy are not of themselves enough; there must be method and knowledge superadded. As Lord Rosebery said, "haphazard energy is all very well, "but it is not sufficient for the time that is coming."

Some good people affect to sneer at everything else beside "practical experience," and think all training in business methods a useless fad, of which such an institution as the School of Economics is the embodiment. Those persons may be given pause by the remark of the United States Ambassador, that in his country—where business men are not altogether failures—they regarded such institutions "as "among the chief means of maintaining their part in that "rivalry which they were maintaining, and meant to main-"tain with all their force, with their sister nations of the

"world . . . a rivalry of brains, of skill, of courage in "the great industries of life." We of the gas industry have a rivalry to maintain. Let us look to it that we are doing our best to obtain the necessary supply of brains, skill, and courage.

### To Amend the Patent Law.

THE Blue-Book containing the Report of the Committee appointed by the Board of Trade to inquire into the Working of the Patent Acts, on certain specified matters, has now been issued, and is generally on the lines that have been anticipated. The question of any general system of examination as to novelty was expressly reserved by the terms of the reference, which directed the Committee to inquire whether any additional powers ought to be granted to the Patent Office to control, impose conditions on, or otherwise limit, the issue of Letters Patent in reference to obviously old and anticipated inventions. The Committee were also directed to inquire into the working of section 22 of the Act of 1883, and to consider the question of priority in regard to foreign applications. With a view to ascertain approximately the number of inventions to which the first point of the reference would apply, the officials of the Patent Office were requested to examine in this sense the complete specifications accepted during a selected week in each of the three latest years, and to carry these examinations back to the year 1877 inclusive. The officials were equal to the occasion, which is greatly to their credit; and they found that, of the total number of specifications accepted, 57·59 per cent. were not anticipated, 6·69 per cent. had been wholly covered by previous patents, 35·31 per cent. had been partially anticipated in the same way, 0·29 per cent. were obviously old, and 0·12 per cent. disclosed no manner of manufacture. In other words, the examination showed that upwards of 42 per cent. of the specifications accepted appear to have been anticipated either wholly or in part.

The most gratifying discovery of this investigation was the fact that the proportion of specifications describing inventions obviously old was so small as to be negligible. This is very creditable to the common run of British patentees, and argues the possession by them of a distinctly high average of knowledge of the subject-matter dealt with in their applications. It also relieves the office of all care for considering the novelty of applications, on general grounds, as distinguished from those repeating previous patent specifications. The conclusion of the Committee is that the inquiries of the office might profitably be extended, as already reported, to ascertain whether any application for Letters Patent has been anticipated in prior complete specifications dating to fifty years back. The result of such inquiry, when affirmative, would be communicated to the applicant, but not made public; and the applicant would be given a period of time in which to amend his specification. We have no hesitation in saying that this extension of the work of the Patent Office would be an enormous assistance to inventors, and would be cheap indeed at the extra fee of £1 proposed to be charged on sealing the patent.

With regard to the famous section 22, the Committee found a consensus of opinion existing to the effect that the whole matter is beset with difficulties, which is not to be wondered at, having regard to the novelty and great commercial significance of the enactment. The Committee give up the idea of amending the clause, and recommend its repeal and substitution by fresh legislation of a comprehensive character. This new law would be set in operation by an interested person; and the occasion for it would be the furnishing of proof that the reasonable requirements of the public in reference to the invention have not been satisfied because of the neglect or refusal of the patentee either to work or grant licences on reasonable terms. The jurisdiction would be transferred to the High Court. Of course, fresh legislation would be necessary to carry out the recommendations of the Committee, which must lie on the table for a year at least.

### The Good Example of Halifax.

HALIFAX has done well by the gas consumers in refusing to advance the price of gas in order to subsidize the rate fund; and the Corporation thereby enter the small and select, but it is to be hoped growing, company of British municipalities whose financial arrangements are fair and above-board, and do not conceal any indirect taxation of the helpless minority. The facts were briefly recorded in last week's "JOURNAL." A proper sense of the principle involved in municipal gas supply upon just terms appears to have been created among Halifax town councillors by the discovery that, if the usual subsidy from the Gas Department was to be forthcoming in aid of the rates, the price of gas would have to be raised. This is a very natural and quite intelligible occurrence. So long as matters go on as usual with the public gas supply, it seems quite a harmless proceeding to vote something handsome out of the profits in aid of the rates. Nobody appears to feel it; and it is a comfortable way of helping the spending departments of the Municipality. But when it becomes a question of clapping an extra charge upon the gas consumers with the expressed object of subsidizing the rate fund, the matter assumes an entirely different aspect. Many town councillors who saw no reason to object to the continuance of an old-established practice, reconsidered the position in the light of the new impost.

At Halifax, fortunately, the issue was clear. Money was required to carry on the affairs of the town; and it was a question whether the rates should be raised in order to meet the deficiency, or the price of gas be increased. The latter alternative was, naturally, favoured by the Finance Committee of the Corporation. There is nothing a Finance Committee hates more, as a rule, than "facing the music" with a recommendation for a higher rate. On this occasion, the hackneyed excuse was once more proffered—that "the price "of gas in other towns was higher than in Halifax." Of course it is; and so it must be, and ought to be. This readiness of gas-supplying municipalities to get behind one another on every possible occasion, is not an admirable propensity. Fortunately, in Halifax the Corporation electricity supply undertaking furnished a most effectual defence for the gas consumers of the borough. This is a kind of helpfulness of electricity to gas which Mr. Corbet Woodall did not include in his category of such benefits. It came out that, under the arrangement suggested by the Finance Committee, while one local firm who used electricity would benefit to the extent of over £50 per annum, another firm, using gas, would be handicapped to the tune of £80 a year or more. The Electricity Department does not contribute any profits to the rates.

The facts being indisputable, one member of the Corporation after another joined in the protest against the indirect taxation of gas consumers as a means of helping the Finance Committee out of their difficulties, and raised his voice for meeting the emergency fairly with a higher rate. To their honour, the Town Council ultimately rejected the proposal to increase the price of gas by a vote of 29 to 17; following this up by adopting the straightforward course of raising the borough rates by 4d. in the pound. This is as it should be. All corporations who learn the lesson that gas supply is not entrusted to their hands just for the purpose of deluding the community as to the cost of local administration, are helping to discredit a rotten and perilous system. If this lesson has been taught in different parts of the country as a consequence of the enhancement of the cost of coal during the past year, this additional burden upon the gas undertakings, grievous as it has been, will, in this regard, prove to have been a blessing in disguise.

### Trade Discounts and Other Matters.

WE have received from various sources, which must, of course, remain confidential, abundant confirmation of the opinion we have expressed as to the double-dealing of some manufacturers and mercantile firms with gas companies. Our article on "Trade Discounts" has "touched the spot" where many a gas manager who desires for himself the reputation of being a good business man feels a particular soreness. The system of dealing with supply firms which suits the club luncheon and hotel smoke-room style of negotiating orders, is not so satisfactory to the men who hate that kind of thing, to which they rightly ascribe many of the ills that have afflicted the gas engineering profession in the past, and are unhappily not yet eradicated. A gas manager who sincerely desires to obtain the best terms for his principals, is at times met by some bland member of a "ring," and bested with tricky price-lists and occult discounts. In respect of coal, he has lately felt himself in much the same case as a pigeon in the clutches of a double-headed hawk—one beak being that of the coalowner, and its fellow belonging to the Trade Union miner. He would be more than human did he refrain from rejoicing at the welcome sight of a toppling coal market, and proclaiming abroad his indifference to the deprivations which the members of unholy combinations must expect in consequence. The straightforward gas manager knows, or has a strong suspicion, that the individual members of a ring are not

insensible to ameliorating influences of the right kind. He believes that other buyers, similarly situated, manage to get advantages; and the thought is a very irritating one.

Nor is this really the worst of it. If the gas-works official plainly declares his desire for better treatment, the chances are that some at least of his business connections will straightway jump to the conclusion that he wants something for himself. We know for a fact that the representatives of some firms are no longer received in certain gas-works offices, for having committed blunders of this kind. In other cases, a hard-and-fast rigidity in the matter of terms is accompanied by an overwhelming and embarrassing willingness to "oblige" in a variety of the ways which are not at all appreciated. Mr. Livesey has struck, again and again, at other manifestations of the "ring" system in trade; but those who are committed to it have much more than Mr. Livesey's indignation to fear, unless they reconsider their ways. The conclusion of the matter is that if traders in the necessaries of gas manufacture persist in treating gas companies unfairly—in the sense of putting them at a disadvantage as compared with other buyers—one of two things will happen. Either the companies will make more things for themselves, as they might very easily do, or they will encourage new firms to compete for their custom. They do not dispute the claims of some firms to recognition for having perfected, at their own risk, some useful specialities. But they do object to being taxed in perpetuity to keep up the monopoly of trade in common articles which anybody can make equally well. The sooner this idea is assimilated by the firms which mean to keep their customers, the better for the attainment of their desire. It is useless to blink the truth; there is deep and widespread dissatisfaction with the state of things here referred to.

# WATER AFFAIRS.

## The County Council Subdued.

THE result of the interview which the deputation from the London County Council had with the President of the Local Government Board on Thursday last was exactly what we expected it would be. Mr. Long firmly refused to move in the slightest degree from the position he took up when he was waited upon by members of the old Council towards the close of last year. He expressed regret that it was so frequently necessary for his Department to have to decline to accede to the Council's requests; and as he was careful to point out that their refusal did not proceed from any hostility to that body, it must be concluded that the demands had been of such a nature as to justify their rejection in the public interest. In the present case, the circumstance that the Water Companies had drawn upon themselves a more than usually large share of public indignation by putting forward their new regulations, was freely used at the recent election as a weapon for fighting the party who are generally regarded as the friends of the Companies; and the ultimate success of the tactics in the return of an increased Progressive majority was, with their usual "wrong-headedness," assumed by the members of that party to be a "mandate" to them by London to push forward the Council's water policy. Never had there been a greater mistake made. It was an expression by a small section of the entire body of the ratepayers of London on certain details connected with the supply of water; and therefore to go and flaunt this so-called "mandate of the people" in the face of the chief of a Department of State, in the hope that he would be intimidated thereby into using his influence to change the settled policy of the Government in regard to the London Water Question, was simply to court a rebuff. Mr. Long did not, however, treat the deputation curtly. He listened attentively to all Mr. M'Kinnon Wood had to urge in favour of his proposal that the Council's Purchase Bill should be granted a second reading and be referred to a Committee; and then he quietly demolished his arguments.

In the first place, Mr. Long said he could not accept the statement that the recent election had turned in such a way upon the Council's water proposals as to materially alter the position as compared with what it was at the close of last year. At the same time he acknowledged that there was a fairly unanimous opinion that the water undertakings must be purchased, and an end speedily put to a long, exhausting, and terribly vexed question. But the President pointed out that while there was practical unanimity on the general question, it could not be said that it covered the particular form of purchase favoured by the Council. Herein lies the whole difficulty. After exhaustive inquiry, a Royal Commission state specifically what, in their opinion, should be the constitution of the purchasing authority, and declare in most unequivocal language that it should not be the Council. Furthermore, the Commissioners show how the authorities who, though water consumers, are outside the area over which the Council have jurisdiction, are to be dealt with. Finally, they put forward certain proposals in respect of the financial part of the question. The Government announce their approval of these recommendations; and the head of the Department within whose purview such matters come, promises to introduce a measure to give effect to them. Notwithstanding all this, the body specially signalized as the one which is not to be the purchasing authority brings forward a Bill which does not carry out the recommendations to which the Government have given adherence, and then boldly asks for its support. Mr. Long told the deputation plainly that if the Council had seen fit to base their measure upon the report of the Commission, accepting the guiding principles laid down therein, their representatives would know perfectly well what would have been its prospects in Parliament, and what possibility there would have been of the opposition now offered to it being disarmed or actually turned into support. He deeply regretted that this course had not been adopted—that a *modus vivendi* had not been found between the Council and those who differed from them. With this expression of his views, he brought the interview to a close; leaving the deputation—subdued by what has been called his "cold-blooded reply"—to decide whether they would withdraw their Bill or let it risk the ordeal of the second reading stage. Undaunted by their ill-success at Whitehall, the Water Committee of the Council decided, at their meeting the next day, to take the latter course—laying the whole position before the House, and throwing all further responsibility on Parliament and the Government, who will doubtless be able to bear it.

## Water Supply in Essex.

WHILE London is exercised on the question of its water supply, it may not be out place to glance over its eastern border, and see what is going on in Essex. Owing to the overflow of the Metropolis, so to speak, the population in that county has lately been growing apace. Between the date of the last census and 1899, it went up about 200,000; and it is estimated that in another ten years it will have reached 1¼ millions. To accommodate the people crowded out of London in this direction, houses have sprung up like mushrooms; about a thousand a year having been erected at Ilford for something like six years in succession. The result has, of course, been to tax to the utmost all the available sources of water. The East London Company are responsible for the supply in the westernmost portion of the county; while the South Essex Company serve the small towns and villages in the district indicated by the title. Everybody who has followed the Metropolitan Water Question during the past few years knows what has been done by the former Company to meet the demands upon them; and the efforts put forward last session by the Directors of the latter to improve their undertaking will be fresh in the recollection of our readers. Their application to Parliament for authority to construct additional works and to extend their limits of supply was, however, refused by a Committee of the House of Lords, although, as it seemed to us, it was fully justified. The same Committee, it may be remembered, rejected a Bill promoted by the Local Authorities of the district to obtain sanction to the constitution of a Joint Water Board to acquire the Company's undertaking and control the supply. In the autumn of last year there was a rumour that the project was to be revived; but it does not appear to have resulted in action. In the meantime, the Ilford District Council have become alarmed as to the quality of the Company's water, and have had samples analyzed; and it must be acknowledged that it has not come well out of the trial. The County Council, too, have been moving in the matter of the general question of water supply; and a short time ago they instructed Dr. J. C. Thresh, the Medical Officer of Health, to report upon all the available sources. The result of his investigations, which cover not only every district, but every village therein, is to show that the rural water supplies are far from satisfactory. It is to be hoped that his exhaustive report may lead to improvement all round.

# ESSAYS AND REVIEWS.

## THE CONDUCT OF BUSINESS.

Only those who have had actual experience of the management of a business, or of a department of a business, having dealings of considerable magnitude with a numerous and varied body of customers, can fully realize the importance of adopting, and of closely adhering to, systematic methods of treating every detail of that business. Always, of course, provided that in the planning of these methods due regard is had to the character of the business, so that the systems adopted shall not be liable to clog the progress of affairs by that over-elaboration, that subordinating of matters of moment to matters of detail, which is comprehensively and expressively described as "red tape." In the case of gas and water companies, whose customers are, in many instances, numbered by tens of thousands, it is especially essential that all routine work should be carried out systematically. The manager who is a capable man in every other respect, but has never acquired the habits of keeping his papers in order, of noting exactly his appointments, or of recording accurately transactions verbally conducted, is seriously handicapped, and the business he has to direct will surely suffer.

Very little attention has, however, been paid to this necessity by the writers of handbooks, of the making of which there is no end. Especially welcome, therefore, is a little book, entitled "Hints on the Conduct of Business," by Sir Courtenay Boyle,* which was published last year. This work, while designed in the main for the guidance of Civil Servants and Private Secretaries, contains much that is of value to all engaged in business. "Money saved," runs the old saying, "is money earned;" and so it is of time, which is indeed money. It is, however, very generally the case that, in order to save time in the long run, it is necessary to avoid saving it in the first instance. More haste, less speed, is true in business, as in every other walk in life; and that may be said to be the whole burden of Sir Courtenay's tale. Have a systematic way of doing everything, and stick carefully to your system. The extra time expended will be repaid a hundred-fold. Especially remember to be careful in small matters of detail. It is these that are most generally neglected; but small slips often cause great inconvenience to him who makes them, and to many others besides.

Sir Courtenay devotes much of his space to these apparently trivial, but potentially very important, details. He gives up one chapter to the opening and closing of letters—at first sight "the simplest thing imaginable," but really affording many opportunities for blunders having in them possibilities of grave inconvenience, delay, or mischief. Another chapter is devoted to the question of the keeping of letters. It is one of the difficulties of a business-house having a voluminous correspondence, that of deciding as to what letters to keep and what to destroy, and how best to store those that are retained so that they may be readily produced if required. As to the first point, Sir Courtenay rightly says: "It is on the whole better to keep too many letters than too few." It may, indeed, be laid down as a rule, in the case of business-houses, to keep all letters, whether obviously important or apparently of no value, for a length of time that can only be determined by the nature of the business. Those who have had many years' experience in dealing with voluminous correspondence with a large number of persons, will certainly have found it to be the case that, of a hundred letters of no evident importance, one or two may eventually prove of very considerable value in completing the links in a chain of evidence.

In regard to the question of what plan to adopt for the storage of letters to ensure their ready production when required, it is difficult to outline any system that will meet the requirements of all varieties of business, and will not involve too great an expenditure of time. Sir Courtenay Boyle, for this purpose, divides correspondence into two classes: (1) Frequent communications from a limited number of persons—such, for instance, as a gas or water company would have from their district officers and their solicitors; and (2) occasional correspondence from a large number of persons—such as a gas or water company would receive from their shareholders and consumers.

Sir Courtenay gives full particulars of a system which he has found serviceable for the keeping, ready for reference, of the first class of communications, and which is doubtless very complete. It, however, appears to us somewhat cumbrous, and to possess no advantages over the simple method of folding letters to an uniform size, endorsing thereon (1) the name of the correspondent, (2) an indication of the subject-matter of the communication, and (3) the date. So endorsed, the letters can be sorted into alphabetical order (communications from the same person being arranged according to date), and put away in bundles monthly, quarterly, or yearly, as the case may require. Sir Courtenay favours the plan of putting away with every letter a copy of the reply; and thereon remarks that, although the machinery of the copying-press has improved, the flimsy copies obtainable are by no means satisfactory for preservation. He adds: "I am not, however, aware of any better method, and until some ingenious person invents one, all that can be done is to make the best possible use of an imperfect machine." Yet only a few pages earlier in the book he has referred to the growing use of the typewriter, from which, as every user knows, it is possible to obtain several copies of a letter with no great additional labour—productions infinitely to be preferred to any copying-press flimsies. The method of endorsing letters which we have indicated is, of course, applicable to both the classes of correspondence referred to by Sir Courtenay. We would, however, here point out an alternative system, which is, perhaps, preferable in those departments of a concern where letters have to be frequently sent forward and back from that department to others, to be dealt with and reported upon. For instance, the rental department of a gas company receives innumerable letters from the consumers which require attention from, or explanation by, the district staff—letters, moreover, which frequently lead to adjustments in the consumers' ledger accounts. One writer requires a supply of gas; another gives notice of leaving; yet another complains of an official's inattention or incivility; while any number are perfectly certain they have never burnt the quantity of gas that mysterious instrument the meter has indicated. All these are matters that must be dealt with by both the office and the outside officials. In such a department, the plan (adopted and elaborated at the Board of Trade) of registering and numbering all letters as soon as received may be recommended. The registered number can then be made useful in many ways, while the letter is in process of being dealt with; and all the correspondence can be eventually sorted and stored in number order. (The final sorting must, however, be very carefully checked, to avoid the possibility of letters being put away under a wrong hundred or thousand, and thereby rendered somewhat difficult to find.) Moreover, any entries made in the books in consequence of correspondence with the consumer—by way of correction of the charge made—needs only to have the registered number of the original communication placed against it, to provide a means whereby the explanatory documents can at once be found. Whatever system of keeping documents be adopted, however, the great thing is to have it faithfully and carefully carried out. Nothing is more annoying and foolish than not to be able to put find papers when particularly wanted.

Sir Courtenay Boyle comes down heavily upon the illegible signature. "Bad hand-writing," he remarks, "is mischievous anywhere. In a signature, it is especially so. An ill-written signature is sure sooner or later to get its writer into trouble. Some sorely-needed answer will miscarry, or some important negotiation go wrong, because someone, not necessarily he or she to whom the letter is addressed, will fail properly to decipher the signature." In this connection, the tale is re-told (not, we think, quite according to tradition) of the Duke of Hamilton, Brandon, and Chatelherault. As we have heard it, the Duke used to sign Ham. Chat. and Brand.; and on ordering some goods from a wine merchant who knew not the signature, he received a polite request for references, "as I have had no previous dealings with your firm." This leads to a reminder to correspondents to always take pains to ascertain the correct title of those whom they are addressing. For instance, as Sir Courtenay points out, "the signature Mary Robinson may be that of Lady Robinson, Lady John Robinson, Lady Mary Robinson, Hon. Mrs. Robinson, Hon. Miss Robinson, Hon. Mary Robinson, Mrs. Robinson, or Miss Robinson." The omission of a title, an affix or prefix, may give rise to no little offence. It may be a weakness, but it is undoubtedly human nature, to prefer having one's identity recognized by those with whom one has dealings. It is a maxim faithfully observed by West-end tradespeople, never to ask a customer his other name if it be in any other way possible to ascertain it. "When in doubt, consult the Directory," is a very good principle to adopt when the signature of an unknown correspondent is not conclusive evidence of the writer's degree.

Dealing with the subject of correspondence, Sir Courtenay notes one or two matters of detail, the neglect of which may give rise to much trouble. Avoid ambiguity. Never say "yesterday," "to-day," or "to-morrow," without adding the day of the week intended to be signified. Never merely date a letter "Monday," or whatever the day may be. If a correspondent suggests an appointment, do not reply: "I shall expect you at the time you name"—the correspondent may possibly forget exactly what hour he did name. Answer every letter at once; if impossible, acknowledge it first and reply afterwards. A negotiation with a touchy person may be rendered more difficult by leaving that person without an answer for some days.

Another point worth remembering is this: If in a letter you refer to a third person, let your communication be so worded that, whether it ought to be handed to that third person or not, no harm would arise if it were. Otherwise, mark your letter "Private." Moreover, when writing to anyone, think of the possible interpretation he may put upon your words. *You* know what you mean; be sure that your reader will be equally clear on the point. In conducting a controversial correspondence, as in making a debating speech, try and put yourself in the place of your opponent. Think of what answer he might make to an argument, and then endeavour so to frame or extend that argument as to meet the possible answer.

Sir Courtenay Boyle condemns correspondence "by reference," even more heartily than legislation by that method. If you refer to the question or proposal contained in a letter from your correspondent, be careful to cite the words in point. It will make your reply more easy of comprehension, and will avoid ambiguity. As an instance of the perils, and the inconveniences, of legislation

* "Hints on the Conduct of Business." By Sir Courtenay Boyle, Secretary o the Board of Trade. London: Macmillan and Co.; 1900.

by reference, mention is made of an old enactment "providing that for a certain offence the penalty was to be that provided for an analogous offence in a section of an old Act, and that the penalty was to be divided between His Majesty and the informer. An inquiring critic . . . ascertained that that penalty was twenty strokes with the cat!" As to controversial correspondence, we are well reminded that "strong language, in the ordinary sense of the term, far more often betrays weakness than shows power."

That part of Sir Courtenay's admirable little book which deals with interviews, conferences, responsibility, and diplomacy in business, must be left over for consideration in a further article.

## ELECTRIC LIGHTING MEMORANDA.

**A Sheffield Clause for Electrolysis—Depreciation and Reserve Funds of Electric Lighting Undertakings—The Electrical Press on Mr. Woodall.**

THE sequel to the observations on electrolysis of Sir F. T. Mappin, at the recent meeting of the Sheffield United Gas Company, is reported in our "Parliamentary Intelligence" to-day. The Bill of the Sheffield Corporation came before the Lords Committee on Thursday, when the question of the necessary protection for the gas-mains was gone into. The Company proposed for insertion in the Bill a clause modelled on the one imposed upon the London United Tramways Company last session. The clause was not at all an onerous one, as it left the burden of proof of electrolytic damage upon the Gas Company. It was objected, on the part of the Corporation, that the gas and water mains in Sheffield are already corroding rapidly, without any question of electrolysis; so that there would be endless disputes if the proposed clause were inserted in the Act. Electrical engineers testified to the adequacy of the Board of Trade regulations for the prevention of electrolysis. On the other hand, Professor Perry declared that the risk of electrolytic injury to gas and water pipes from tramway traction currents is a very real and serious one. The Professor gave a quantitative statement of the extent to which wandering electric currents are capable of carrying away metallic iron and lead, and exhibited samples of pipes which had been so attacked by leakage of current from the City and South London Railway. It was pointed out that electrolysis causes a pitting of the metal—not an ordinary corrosion effect. Eventually, the Committee decided to insert the clause as suggested by the Gas Company, thus creating an important precedent.

The attention of local authorities owning electric lighting undertakings should be directed to the example that is being set as regards the provision of depreciation or reserve funds—to some extent the two are identical—by the leading electric lighting companies of London and the Provinces. Reserve funds suit companies better than depreciation funds, strictly so called; because the money so set aside is applicable to other purposes—such as the equalization of dividends, which are as important to the well-being of the company as adequate depreciation. Besides, the best managed companies, when they find themselves satisfactorily "forehanded," take the opportunity for carrying out various renewals and modernizations out of surplus revenue. An example of this prudent policy was given the other day in the report of the Notting Hill Company's working for the past year. This undertaking, of which Sir William Crookes is Chairman, did not earn a dividend for some years, but now pays 8 per cent. on the ordinary shares. The premiums on new stock issues are added to the depreciation account; and last year a large sum was spent out of revenue on renewing accumulators, which was a special charge that might have been spread over a longer period. In other ways, also, the Company are making provision for the day of purchase by the Local Authority, which will come in 1931. It is to be feared that very few municipal electric lighting undertakings display such husbandry. Their amateur administrators are prone to act as if they believed boilers, engines, dynamos, and mains to be of everlasting durability and efficiency. Many of these over-sanguine authorities will before long have a somewhat rude awakening.

As was to have been expected, Mr. Corbet Woodall's remarks on electric and other street lighting, at the Southern District Association meeting, have considerably stirred up the electricians. The "Electrician" notices a selection of these observations, carefully omitting the references to Continental and American abandonment of arc lighting, and endeavours to be mildly jocular at their author's expense. There is no Berlin, no Place de la Concorde lighting for our contemporary, which calmly claims that it is unnecessary for electricians to inquire what gas engineers are doing in this matter, inasmuch as it is they (the electrical engineers) who "set the pace, and who therefore need not look behind at their rival." Very pretty, indeed; but, unfortunately, not true. Our contemporary writes history thus: "Only when the arc lamp showed higher possibilities of street lighting, and the glow lamp a better scale of lighting buildings, did gas engineers bestir themselves to emulate the new rivals." And it declares that the reason why London is the worst-lit capital in Europe is "the relatively small amount of street arc lighting." This is begging the question, with a vengeance. It is the style of argument favoured by the Scotch divine who said: "Bellarmine says yes to this question. But I say no. And now, having confuted Bellarmine, we will proceed." A critic of street lighting who is so enamoured of what passes, and is paid for, as electric arc lighting in the streets of London that he thinks there ought to be more of it, is beyond the reach of argument. Only, when Mr. Woodall is quoted, it should be done fairly—that is to say, at considerable length. This has been done by the "Electrical Review," which, in an appreciative notice of his address, thanks Mr. Woodall for "sincere criticism and some fresh ideas."

## THE GAS AND WATER STOCK MARKET.

**(For Stock and Share List, see p. 837.)**

THE week just closed was one of marked depression on the Stock Exchange. There were three principal factors producing this situation—viz., the dearness of money, the rejection of peace terms by Botha, and the Tientsin incident. The extreme flatness of mid-week was, however, somewhat relieved before the close by the less threatening aspect of the Chinese difficulty. But business all along was much restricted, and prices were knocked down. Be it noted that on Thursday, Consols changed hands at 95⅝—the lowest figure reached for many years. In the Money Market, tightness was the rule all through the week; and it is not unlikely to last until we get into April. In the Gas Market, business was almost exclusively restricted to dealings in Gaslight and Coke issues, and in fact hardly anything else was touched. Excepting in these stocks, the general tendency was favourable, and a moderate number of improvements in quotations were effected, though the list was not absolutely unchequered with a fall. In Gaslights, the ordinary was naturally the victim of the treatment which the Company's Bill encountered in Parliament, and the price drooped at once from the opening. The lowest point was reached on Thursday, when it changed hands once at 90; but the closing mark on Saturday was rather better—91¼. The net fall in the quotation was 4½ points. The secured issues were adversely affected to a less extent, prices shrinking perceptibly; but only the maximum actually receded. South Metropolitan felt the influence of the reduction in the dividend, and the quotation fell away three points. Nothing at all was done in Commercials. A very few transactions were marked in the Suburban and Provincial group; but there was general firmness in prices. Southampton and Brighton had moderate advances, while in the local market Sheffield made a very considerable improvement after a satisfactory general meeting. Among the Continental Companies, business went at a very quiet rate. The only move was a gain of a couple of points in Continental Union. The remoter undertakings were not conspicuous; but advances were made in Ottoman and Buenos Ayres. Dealings in Water Stocks were extremely limited. Holders evinced no disposition to part hastily in consequence of anything recently transpiring in regard to Government purchase; but several quotations were put at lower figures.

The daily operations were: Very quiet business was the feature of Monday; and Gaslight ordinary and South Metropolitan fell 1 each, but Ottoman rose ½. Tuesday was similar; and Gaslight ordinary dropped 1, but Brighton ordinary gained 1. In Water, West Middlesex fell 3, and Lambeth 2½. On Wednesday, Gaslight ordinary was more active, and moved down 1½, but Buenos Ayres rose ¼. Thursday was identically similar—Gaslight ordinary falling 1, the maximum 1½, and South Metropolitan 1. In Water, West Middlesex relapsed 2½, Grand Junction 1, and New River debenture 2. On Friday, Southampton gained 2, but South Metropolitan fell 1. On Saturday, there was a rise of 2 in Continental Union, but Chelsea Water receded 3.

## A CENTURY OF GAS ENTERPRISE.

"THE story of the discovery and application of coal gas has often been told; but circumstances and the time justify its repetition." These are the words with which Mr. Thomas Newbigging closes the brief introduction to the series of articles, entitled "The Passing of the Century," contributed by him to our contemporary the "Gas World," in the closing month of the past, and the first month of the present year, which have just been reprinted in book form.* It is true, as the author acknowledges, that he had an oft-repeated story to tell again; but he has done it in a manner peculiarly his own. As far as we are aware, Mr. Newbigging is the only gas engineer in active practice who finds recreation from his professional duties in taking flights into the realms of pure literature; and consequently, in his review of the past century, he has produced a pleasant narration where many would have presented only a dull and uninteresting array of facts and figures.

He divides his story into six epochs—namely, the discovery, the initiatory stage, the progress of lighting in London, the parliamentary era, the Association movement, and the epoch of outside competition. His story opens in 1667; but he very soon introduces his readers to the work of Murdoch and Winsor, the latter of whom, he says, "nearly spoiled gas lighting with kindness." But, fortunately for mankind, "it took a lot of spoiling." These pioneers of gas lighting were men of totally different

* "A Hundred Years of Gas Enterprise." By Thomas Newbigging, M.Inst.C.E. London: John Allan and Co.; 1901.

temperaments. Winsor was "a dreamer of dreams;" Murdoch, shrewd, practical, persevering, and silent. They were qualities, however, which enabled their possessors to do something for the enlightenment of the world. The way having been opened, other workers came upon the scene; the ablest mind applied to the subject being that of Clegg, who became the Engineer of the Chartered Company in 1813, and placed the undertaking upon a sound basis. From this time gas lighting in London forged ahead, as testified by the launching of a number of Companies, ending with the Great Central in 1848 and the Surrey Consumers' in the following year. Having brought his story down to the districting period, Mr. Newbigging breaks off to notice the literature of gas lighting, and then proceeds to deal with the progress of gas manufacture and supply. This is strikingly shown by contrast—an illustration being given of a 1000 cubic feet gasholder of the olden time, and immediately beneath it a view of the 12,100,000 cubic feet giant at the East Greenwich station of the South Metropolitan Gas Company. The prosperity attending gas undertakings very naturally gave rise to a desire for their municipalization; and the development of this idea is next referred to. This chapter is followed by two short ones on "Gas Legislation" and on "Associations of Gas Engineers and Managers." In a brief glance backward, the author credits gaslight, and justly, with having brought "light and cheerfulness into the home and into the heart;" and he emphasizes the point that the distinguishing feature in its history has been "distinct and unbroken progression, culminating in unmistakable success." In looking into the future, the author asks what gifts the present century has for the gas profession, and answers his question by saying: "Only such as the members of the profession will for themselves and their art."

With these words we must leave Mr. Newbigging's interesting story, which is illustrated with vignette portraits of some of the principal personages referred to therein—one of the author himself being the frontispiece. The book is printed on art paper, and bound in a tasteful, but rather delicate style.

## PERSONAL.

There has lately been a change in the staff of the Tyldesley Urban District Council. Mr. W. F. MATTHEWS, of Luton, has been appointed Clerk, and Mr. W. H. S. GENDALL will take the management of the gas-works. The latter gentleman was selected out of forty applicants.

Yesterday, at the age of 76, Mr. ROBERT PEAKE KEYS relinquished the position he had so long filled as Secretary of the West Kent Gas Company, and is succeeded therein by his son, who has been associated with the Company's office work, under his father, for about twenty years. We are pleased to state that, in recognition of the late Secretary's faithful services during the whole period of his connection with the undertaking, he was unanimously granted, at the recent meeting of the Company, a retiring allowance equal to two-thirds of his salary. We say "unanimously granted;" but the words are totally inadequate to describe the kindly feeling displayed towards their old servant by Directors and shareholders alike. Wishes were expressed on all sides that he might live long to enjoy his well-earned rest; and to them we have much pleasure in uniting our own. But, though relieved of the stress of active duties, Mr. Key's interest in the success of the Company with whose fortunes his life has been so closely associated will not, we are confident, cease until the day—may it be distant—when that life comes to its close.

## OBITUARY.

The death occurred on the 17th inst., at his residence at Brondesbury, of Mr. COLEMAN DEFRIES. Deceased was in his 73rd year.

The death occurred at Plymouth last week of Mr. R. H. SNOW, who for many years was a Director, and for some time Vice-Chairman, of the Plymouth and Stonehouse Gas Company. Mr. Snow, who was in his 84th year, retired from the directorate a few years ago, but took to the last a keen interest in the affairs of the Company.

We regret to record the death, on the 17th inst., after a long and painful illness, of Mr. RICHARD HACK, M.Inst.C.E., Engineer of the Chelsea Water Company. Deceased, who was in his 58th year, received his appointment in 1886, on the retirement of Mr. Lea, on account of advanced age. He was brother to Mr. Henry Hack, of Birmingham.

The recent death is announced of Mr. FELIX HADLEY. It took place at his residence at Conway, as the result of a paralytic seizure. Associated with his brother, Mr. T. D. Hadley, he established some years ago a large nail-making trade in Birmingham. In 1875, he entered the Birmingham City Council, at the time the municipal policy for which Birmingham became famous was being developed under the leadership of the present Colonial Secretary; and the gas undertaking was just being acquired. Mr. Chamberlain was, it will doubtless be remembered, the first Chairman of the Gas Committee; and at his request Mr. Hadley took the chairmanship of the Works Sub-Committee. He retired from the Council in 1878; but in 1887 his public services were recognized by his appointment as Justice of the Peace.

# NOTES.

### Paint Pigments and Linseed Oil.

The "Painters' Magazine," discoursing on paint pigments in relation to linseed oil, arranges those commonly met with in five classes. These are bases of metals, bases of alkalies, bases united with acids, neutral or inert, and acid pigments. Finally, bases of metals may be either strong or weak. Strong bases harden chemically with the sufficiency of linseed oil necessary for spreading, as red lead, which forms a paint insoluble in water. Weak bases will only unite with a portion of the oil required for spreading, and need a drier and prolonged exposure to harden, as lampblack; but are not waterproof. The bases of alkalies unite with linseed oil and need a drier and long exposure to air, as cobalt blue; but they are soluble in water. Paints containing bases which are mixed bases and acids, as chrome yellows, form brittle coatings, which do not resist water penetration. Neutral pigments merely form an emulsion with linseed oil, and are better out of it, as they only increase its porosity. Lastly, acid pigments, as the anilines, are at first the most intensely coloured, and also the most fugitive, of paints known. Red lead paint is the best preservative of iron; but it wants proper application. Most painters have a weakness for using too much oil with it, to save their labour. It must never be mixed with driers or with boiled oil. The thinner and more worked-out the coat of paint the better. Sulphurous acid gases will darken red lead paint, but not hurt it. There is absolutely nothing known, according to this authority, that will preserve iron from rusting so well as red lead and pure raw linseed oil paint, provided that the iron was clean. All other paints get water-soaked and peel or powder off.

### The Dilution of Ammonia in Fertilizers.

Mr. W. S. Lambert has published, in the "Chemical News," some striking observations on the effect of proper dilution of the nitrogen in artificial manures. Mr. Ostersetzer, of Goulding's Manure Works, Dublin, raised the question; having detected in certain dissolved manure compounds a proportion of ammonium sulphate in a state of molecular division. That is to say, it was more minutely divided than is possible by mechanical means. He connected this discovery with another—the discrepant results shown by some experimental plot croppings, in which the rich ammoniacal mixtures do not always produce the desired effect. Mr. Lambert, taking note of this observation, corroborates its sense out of his own experience of manufacturing fertilizers. In this trade, certain preparations which came out poorly on analysis nevertheless proved better in the field than richer mixtures, which was disconcerting. Mr. Lambert arrived at the conclusion that the richer mixtures could not have been effectively mixed; whereas the poorer preparations had probably been thoroughly mixed at the works where they were made up. In order to test this view, he tried a few experiments with a mixture of sand and gypsum, containing a maximum of 2 per cent. of sulphate of ammonia; but thoroughly distributed through the mass by mixing in solution. The result of the use of such a mixture was surprising; for, tested against well-compounded manures of the usual kind, the nitrogen was found to be almost four times as effective in producing plant growth. It is observed that if cultivators will but take the trouble to make homogeneous mixings, they can fertilize the soil with great economy of the concentrated artificial manures sold. This is the secret of the preparation of low-priced yet effective mixtures, the virtue of which resides entirely in the thoroughness of the mixing; for which, of course, the purchaser pays dearly in price as well as in carriage.

### Strength of Timber.

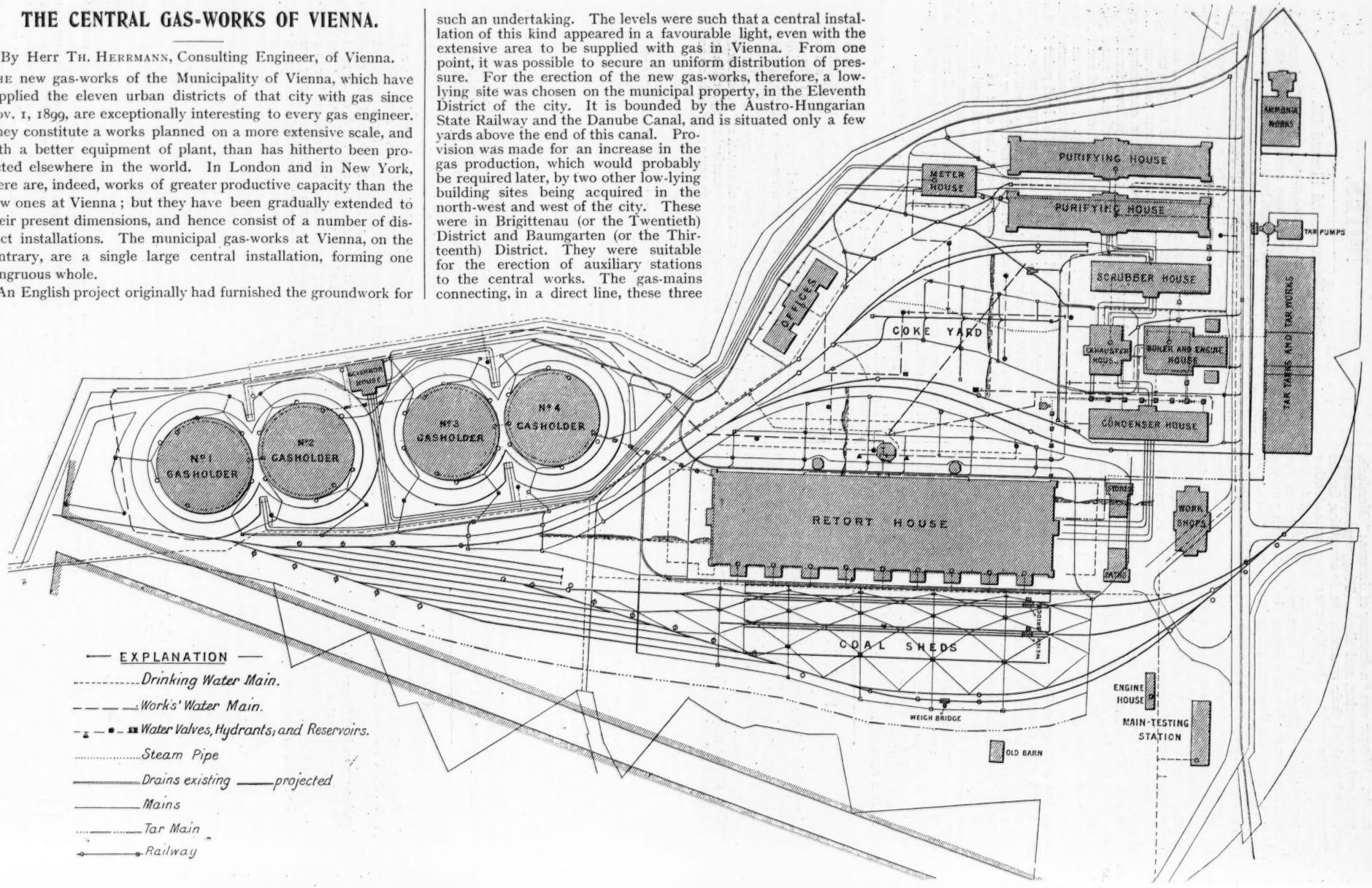
The strength of timber, as affected by seasoning, is a matter upon which little definite information exists. Tests of timber for strength exhibit great variations; so that there is probably no structural material used with so little reference to its calculated strength. Carpentry is a matter of craft, not of computation. Discussing the subject of the strength of timber, the "Builder" remarks that it has long been known that green timber is weaker than seasoned. Experiments have shown that partly seasoned wood is about half as strong again. and thoroughly seasoned wood about 2½ times as strong as the green timber. In the case of pitch pine, American Government tests are cited to show that the average strength of the timber is increased 46 per cent. by ordinary good yard seasoning, and 82 per cent. by thorough seasoning in kiln or house. The importance of moisture as a factor in the strength of timber can scarcely be over-estimated. The difference between the results of various investigations is largely referable to vagueness in this respect. To be strictly comparable, all tests should be corrected to a common standard of moisture—say, 15 per cent. The specific gravity of dried timber is another important element in determining its strength. Other things being equal, the heaviest timber is the strongest. Simple inspection in many cases furnishes sufficient indication of the relative weight of a sample of wood. The greater the proportion of dark summer wood rings, the stronger and heavier the wood. It follows from this fact that slowly-grown timber, with narrow annual rings, is not necessarily stronger than quickly-grown timber. The question is not so much one of the width of the annual rings, as of the proportion between the light and dark parts—that is to say, between the spring wood and the summer wood. The former is only one-half of the weight of the latter.

# THE CENTRAL GAS-WORKS OF VIENNA.

By Herr Th. Herrmann, Consulting Engineer, of Vienna.

The new gas-works of the Municipality of Vienna, which have supplied the eleven urban districts of that city with gas since Nov. 1, 1899, are exceptionally interesting to every gas engineer. They constitute a works planned on a more extensive scale, and with a better equipment of plant, than has hitherto been projected elsewhere in the world. In London and in New York, there are, indeed, works of greater productive capacity than the new ones at Vienna; but they have been gradually extended to their present dimensions, and hence consist of a number of distinct installations. The municipal gas-works at Vienna, on the contrary, are a single large central installation, forming one congruous whole.

An English project originally had furnished the groundwork for such an undertaking. The levels were such that a central installation of this kind appeared in a favourable light, even with the extensive area to be supplied with gas in Vienna. From one point, it was possible to secure an uniform distribution of pressure. For the erection of the new gas-works, therefore, a low-lying site was chosen on the municipal property, in the Eleventh District of the city. It is bounded by the Austro-Hungarian State Railway and the Danube Canal, and is situated only a few yards above the end of this canal. Provision was made for an increase in the gas production, which would probably be required later, by two other low-lying building sites being acquired in the north-west and west of the city. These were in Brigittenau (or the Twentieth) District and Baumgarten (or the Thirteenth) District. They were suitable for the erection of auxiliary stations to the central works. The gas-mains connecting, in a direct line, these three



points of the city—namely, the Central works in the Eleventh District, the Baumgarten station in the Thirteenth District, and the Brigittenau station in the Twentieth District—would form a nearly equilateral triangle. The mains from the Central works in the Simmering (or Eleventh) District follow the natural rise in the ground-level, and by an uniform ascent reach the highest point, which is about 400 feet above the present level of the Central works. As the pressure of gas increases at the rate of about 1 inch of water for 104 feet of height, there will automatically be an increase of pressure of upwards of 4 inches between the works and the highest point.

It is generally laid down that every gas-works must be so designed that the plant for each specific operation—for instance, carbonizing, condensing, exhausting, scrubbing, purifying, measuring and storing—does not form a separate independent installation, but rather that each type of plant comprises similar duplicate installations, which serve together for the maximum requirements, but each of which may also be worked apart from the remainder. For example, certain settings may be put out of action, and their duty performed by others for the time being, or additional settings may be put in action at any time to meet a temporary increase in demand. The new gas-works conform to this principle, for they comprise four sections or works, which, indeed, are collected on one site, but are so arranged that they may be in operation together or quite independently of one another. It is possible, moreover, to operate at will any particular apparatus of one section in conjunction with the rest of the plant of one or other of the remaining sections. The apparatus of each of the four sections is divided into two sub-sections; so that it is possible, in case of accident, to work with only half the plant of the section. By constructing the works according to this plan, it has been possible to obtain the greatest conceivable reliability in working, combined with the lowest capital outlay. If, in place of four gas-works concentrated at one spot, four works had been erected at different places more or less distant from one another, then for each of these works reserve plant must have been provided on the same scale as for one combined works. Thus for four detached gas-works four times as much reserve plant would have been required as for the central works; while no greater security would have been obtained thereby.

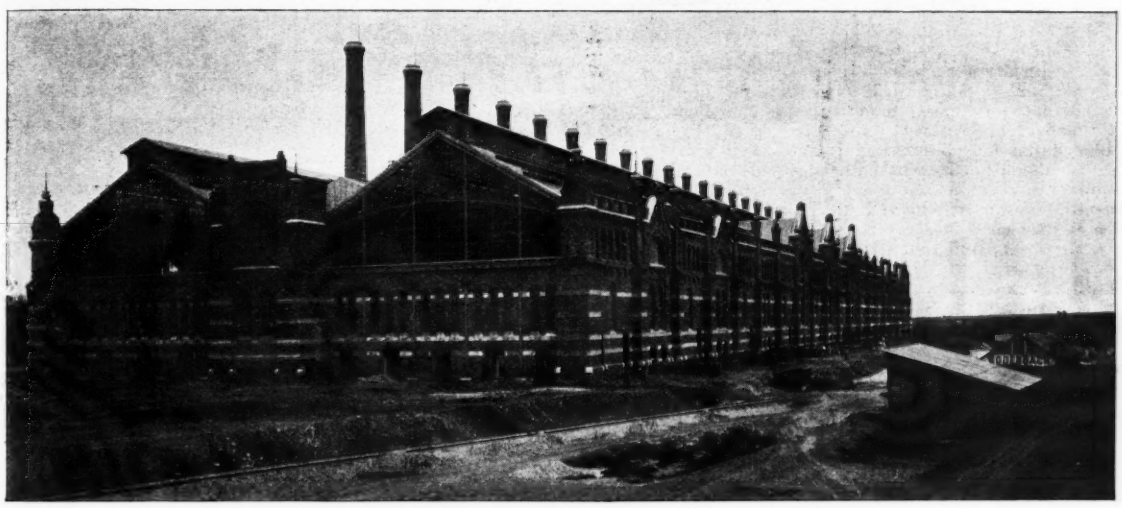


FIG. 1.—END AND BACK OF RETORT-HOUSE.

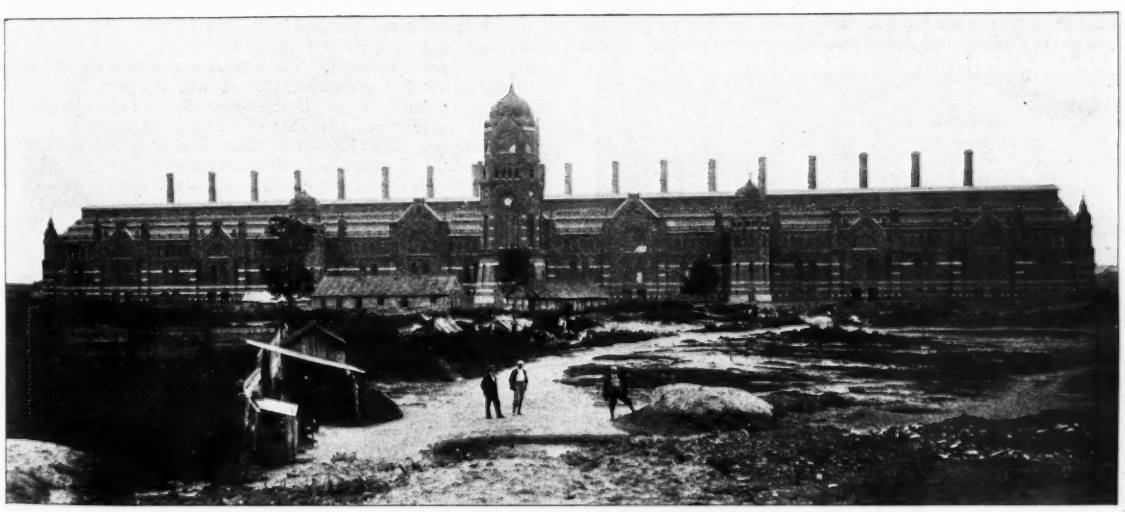


FIG. 2.—FRONT OF RETORT-HOUSE.

The centralization of the manufacture of gas at one spot is economical of capital outlay, not merely on account of the smaller extent of the reserve apparatus which is necessary, but also because of the saving in many incidental appliances, which each detached works must possess. These are only once required by a central works. Among them may be named the railway connections, roadways, workshops, laboratory, experimental works, offices and residences, stores, stabling, workmen's lobbies, water-tank, waggons, &c. Again, in providing much of the accessory plant—such as ammonia works, tanks, reservoirs, tar distillery, &c.—it is calculated on the basis of a quadrupled capacity. Finally, the magnitude of the central works makes it remunerative to procure many appliances that it would not pay to purchase for smaller works, which consequently do not have the benefit of them. Likewise the whole of the works management, administration, wages, outlay on materials, and repairs and maintenance of works must be cheaper for one central installation than in the case of detached ones. Against the security in operation of a central works, as compared with separate ones, which security as the above indicates, without doubt does not decrease from the technical standpoint with centralization, but rather increases—could be urged only injury from fire, explosions, floods, earthquakes, &c. Such objections, however, are very feeble. From earthquakes, protection cannot be secured; but care should constantly be given at the proper time to ward off floods. Fire and explosion could only occur within limits in any works; they are rare, and have never resulted in serious interruption of the whole of the operations. From what has already been said, it will be evident that centralization of gas manufacture is far preferable in every respect to a number of detached works.

The following are the dimensions of the Vienna Central Gas-Works: The land has an area of 66½ acres. Its greatest length is 2950 feet, and its greatest width 2130 feet. The carbonizing plant is designed for a maximum make of 15¼ million cubic feet per 24 hours, or 3050 million cubic feet per annum. The remaining apparatus is provided for a maximum make of 21,190,000 cubic

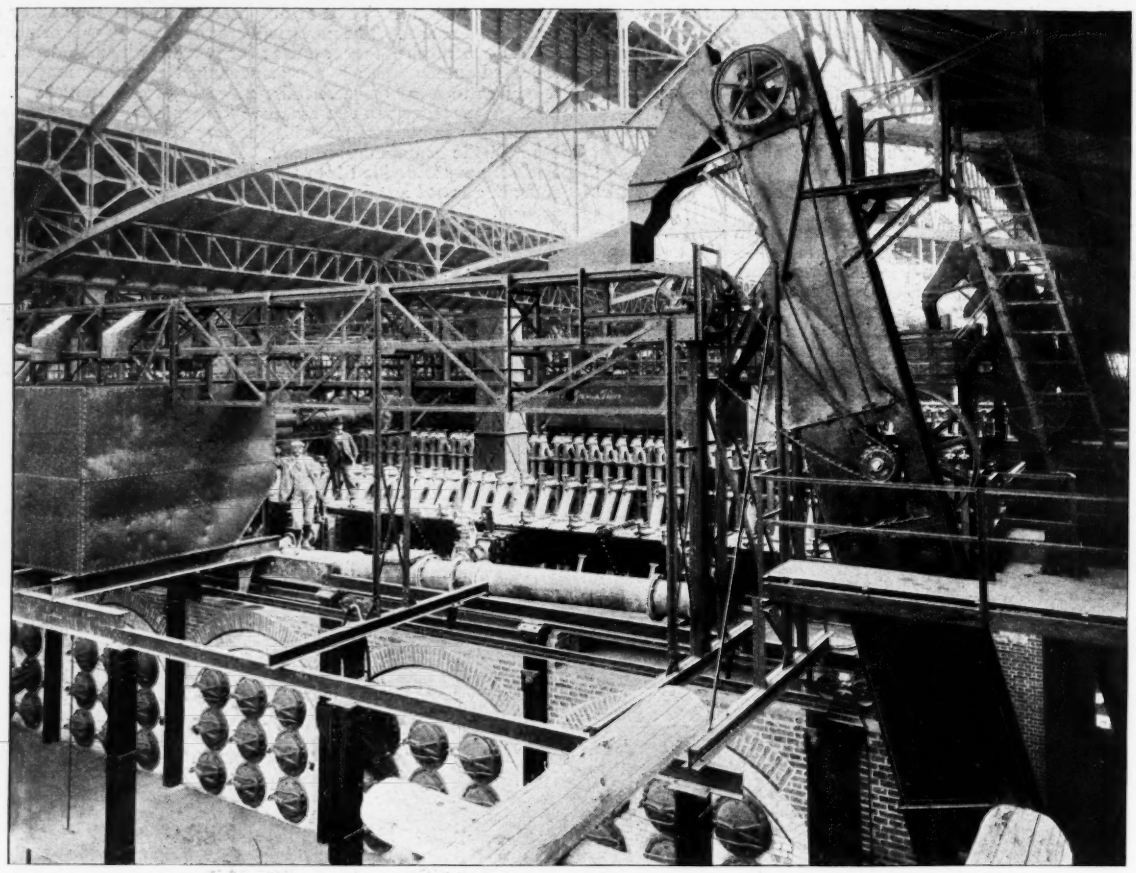


FIG. 3.—COAL ELEVATING AND CONVEYING MACHINERY IN RETORT-HOUSE.

feet per 24 hours, or 4240 million cubic feet per annum. It was determined that the buildings should have an elegant exterior, while adequately fulfilling their purpose. They have been so placed that the available land is utilized to the fullest possible extent, while reliability and safety in working are assured. At the same time, a clear view over the most important parts of the works from the manager's offices has been secured. Only types of retort-settings, engines, apparatus, &c., were adopted, of which the capacity, efficiency, and economy in all respects had been proved beyond doubt. The dimensions of the connections for both gas and tar and liquor, as well as the sizes of the plant, have been fixed so that they may readily deal with the maximum day's output of gas.

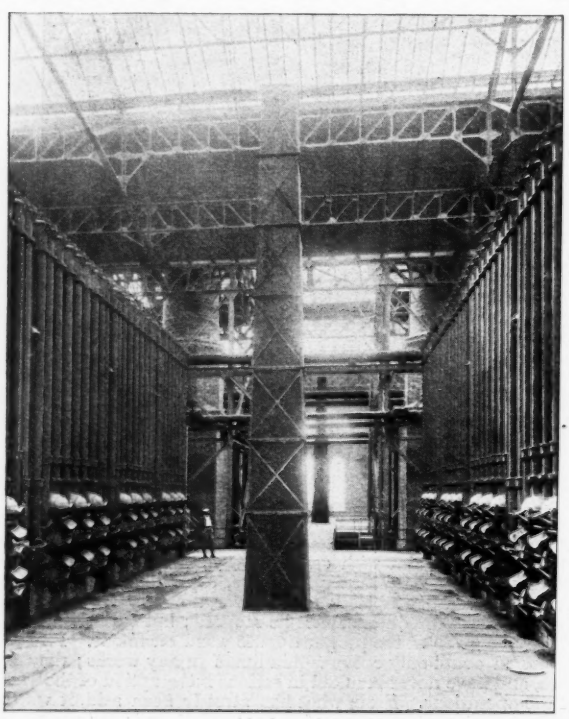


FIG. 4.—DRAWING STAGE OF RETORT-HOUSE.

The railway plant for the transport of coal and bye-products has every trustworthy provision for dealing with traffic of the magnitude contemplated. The metals are laid partly on viaducts and partly on the ground-level. It will be possible to deliver goods conveniently at any time to any store on the works. Well-ventilated lobbies are provided for the workmen, which will afford protection against inclement weather during the intervals of rest from labour. In order to enable the men to heat food which they may bring with them, a suitable workmen's dining-hall has been erected. Hygienic and sanitary requirements have been provided for by installations of shower-baths and water-closets, as well as a thorough system of drainage of the whole works.

The rooms in which business is transacted with the public are completely cut off from the works buildings. Coal received by railway is deposited in sheds at the back of the retort-houses. These coal-sheds comprise two buildings—one 940 feet long and 90 feet wide, and the other 938½ feet long and 83 feet wide. The coal is deposited in the sheds in heaps extending the whole width of the shed, and about 65 feet wide and 16 feet high. A space is left between each pair of the heaps, both for the purpose of communication and management, and also as a safeguard in case of spontaneous ignition of the coal occurring. It is thus possible to get rapidly at both sides of the coal in which ignition has taken place in any of the heaps. The two sheds would hold 2,965,600 cubic feet of coal; but from this amount 20 per cent. must be deducted for the passages left for communication between the blocks. Therefore the capacity of the sheds becomes reduced to 2,372,480 cubic feet.

On the basis of an annual make of 3050 million cubic feet of gas, the coal required for carbonizing would amount, in all, to 283,400 tons or (say) 10,171,152 cubic feet. The quantity of coal which can be stored in the sheds, therefore, amounts to 23·3 per cent. of the annual consumption; or, in other words, the works have a store of coal sufficient for 46 days' use during the heaviest working period of the year. If the increase in gas consumption makes it necessary later to store a greater supply of coal, this can readily be done on the spare land at the works. The transport of the coal from the place of discharge to the stores, and thence to the coal-breakers and elevators of the retort-houses, is effected by means of waggons on a light railway line of 2 feet gauge.

The coal is carried by means of the light railway from the sheds to the breakers; and thence it is raised by elevators to a height from which it is poured on to conveying bands, which carry it into receivers placed above the retort-stacks. From these receivers, the coal is run into the several measuring-hoppers from

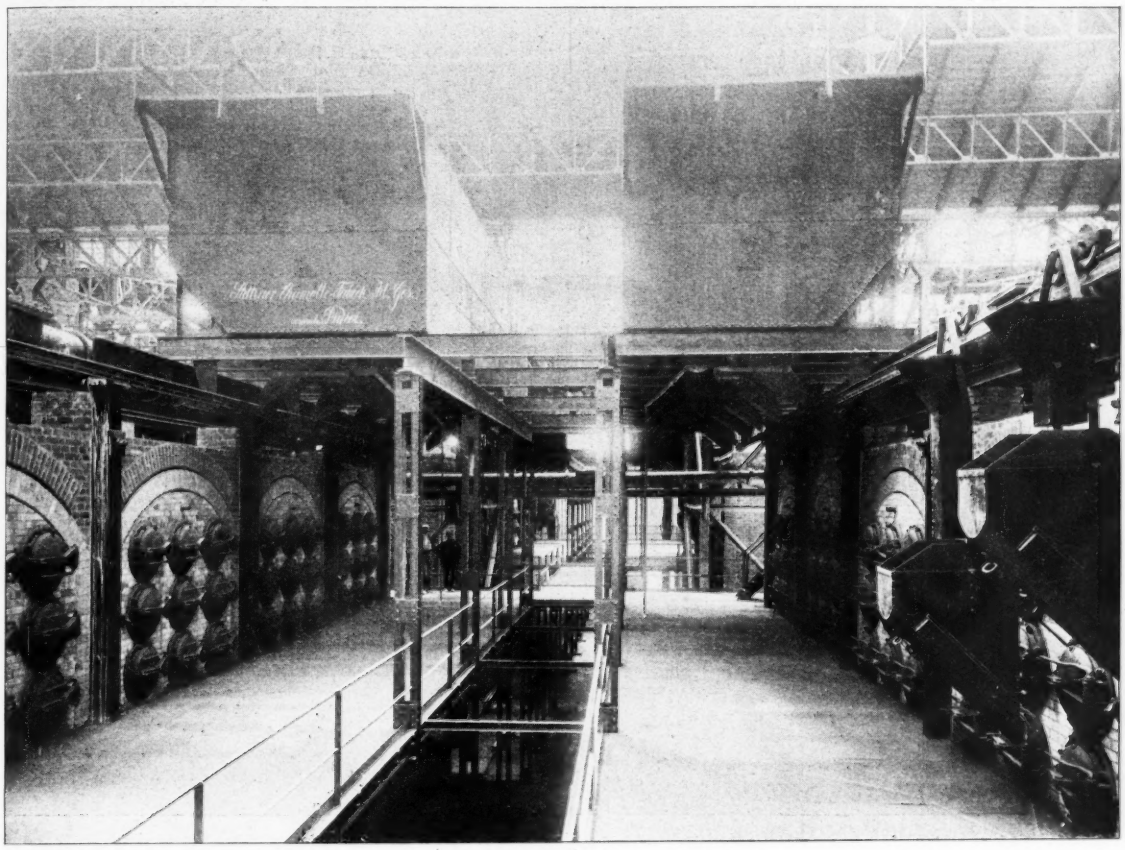


FIG. 5.—RETORT-HOUSE, CHARGING STAGE.

which the retorts are charged. There are, all told, 180 Coze settings, each comprising nine retorts inclined at an angle of about 32° to the horizontal. The heating of the settings is effected by means of carbonic oxide gas, which is produced in generators on the Hasse-Didier system placed in front of the settings. The gas is burnt in a chamber above the generator, by means of heated air which is conveyed to it. The length of the retort-house is 945 feet over all. It is under two spans. Each span is 88 feet wide; and the two halves of the house are separated by ironwork nearly 28 feet wide, in which the chimneys are

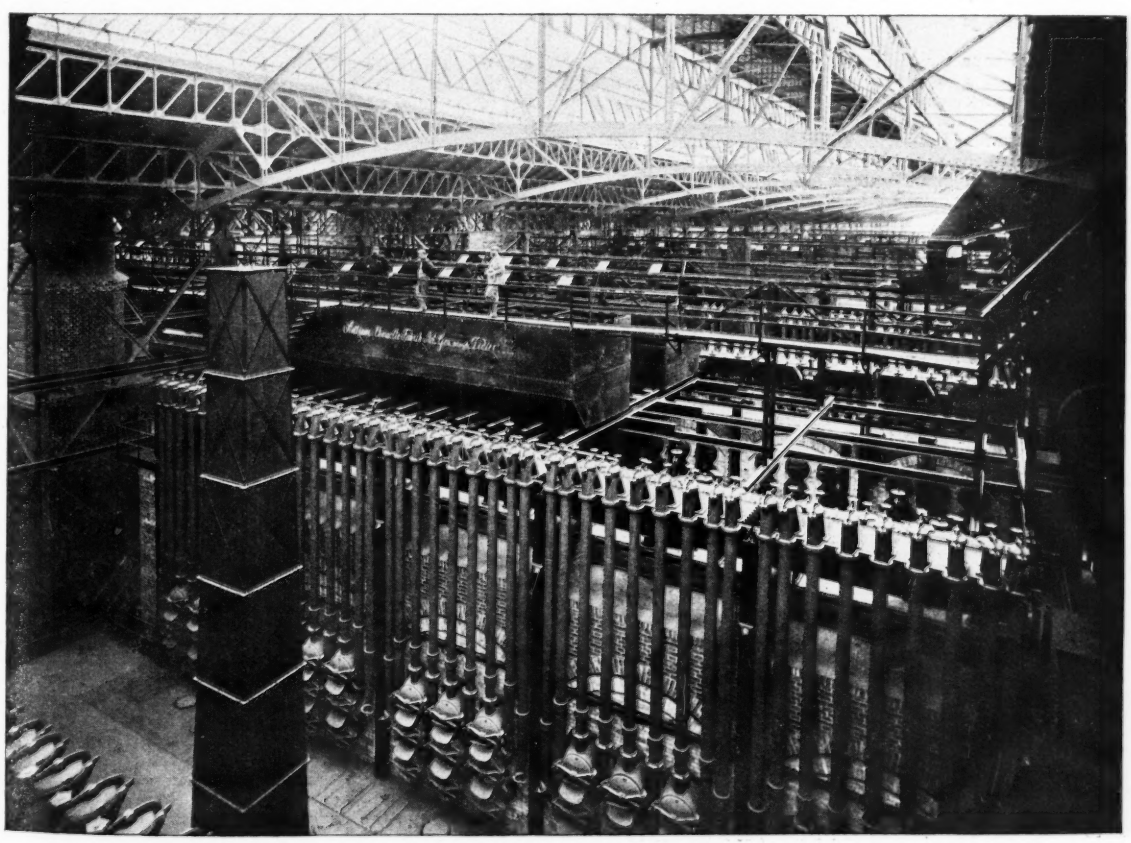


FIG. 6.—VIEW OVER TOPS OF BENCHES IN RETORT-HOUSE.

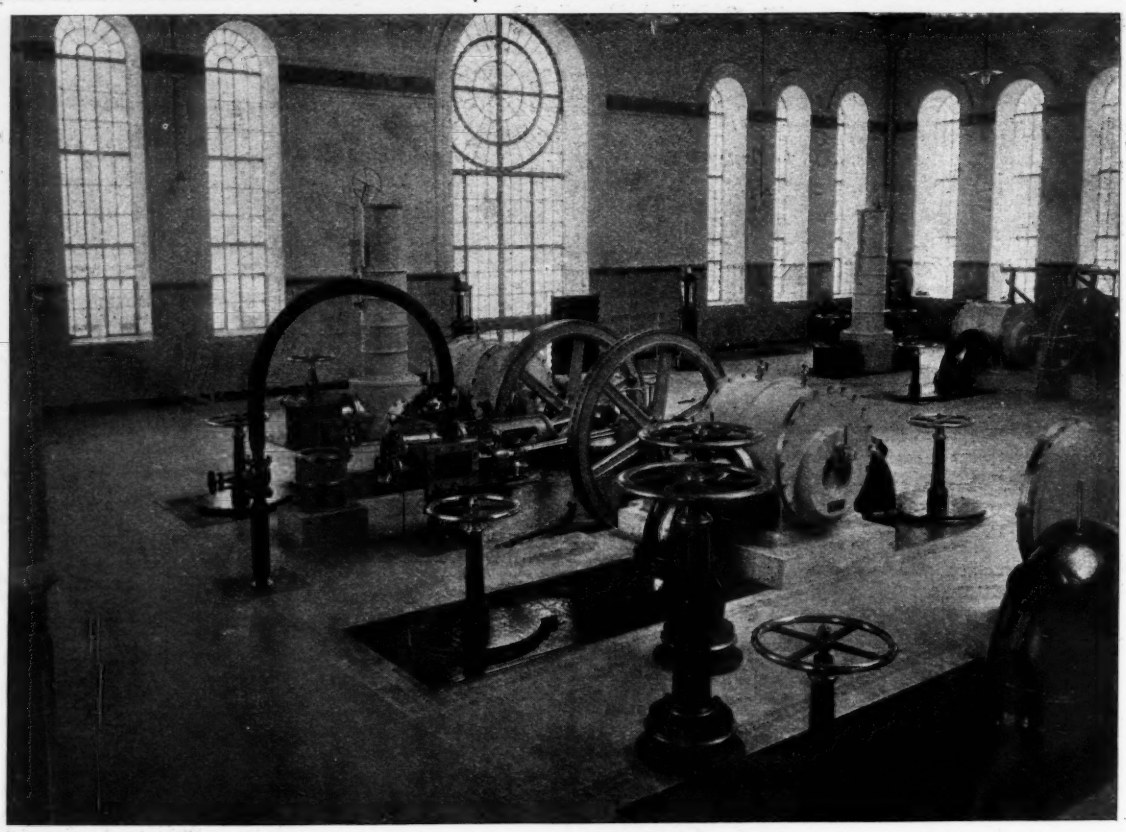


FIG. 7.—EXHAUSTER-HOUSE.

built. The height of the retort-house to the supports of the roofs is 49 feet. The roofs are so constructed that, not only are there ventilating openings in the gables of each roof, but there are also ventilating slots beneath the glass roofs. By these means, the vapours emitted when the retorts are drawn and charged are carried off from the house. In the event of the make required increasing in the course of time, it will be possible to remove the ends and lengthen the retort-house by about 112 feet; so that to the existing 180 settings a further 60 settings of nines will be able to be added.

The productive capacity of the 180 settings, comprising 1620 retorts in all, amounts to 17,800,000 cubic feet of gas. Consequently, as only 15,250,000 cubic feet are required, there is an ample reserve provided. With a charge of 440 lbs. of coal, each retort can furnish a make of 12,700 cubic feet of gas per 24 hours. The gas produced in the settings is conveyed away by four sets of pipes, which gradually increase in size (in proportion to the number of retorts which discharge gas into them) from 16 inches to 40 inches in internal diameter.

From these pipes, the gas passes on to the condenser-house, which is 270½ feet long and 65½ feet wide. It stands with its longer axis parallel to the axis of the retort-house, and is 33 feet high, from the floor to the supports of the roof. The gas, which enters the condenser-house by the four sets of 40-inch pipes already mentioned, passes through eight batteries of condensers within the house. As a safeguard in working, the four sets of pipes have been connected at the point where they enter the condenser-house, and the connections provided with valves, so that it is possible to work with any one apart from the rest, or to work any required number of them together. Along each side of the house are situated four batteries of condensers, which are so arranged that the two batteries standing opposite one another form one system. Each of the batteries consists of seven circular sheet-iron condensers, for combined atmospheric and water condensation. The plates of the condensers are connected with one another by Mohr's zig-zag pipes, 33½ inches diameter, in order to obtain greater efficiency.

The complete circular condensers have a height of 26¼ feet, and an external diameter of 4 ft. 11 in. They contain atmospheric condensers 3¼ feet in diameter. Each circular condenser contains besides, in the space through which the gas passes, twenty Mannesmann tubes, 5 inches diameter, through which water circulates. A zig-zag tube, 5 inches diameter, passes through the gas-space in the middle, for the circulation of the cooling water with the Mohr's connecting-pipes. The cooling water circulates through the condenser in the opposite direction to the stream of gas. Any condenser battery can be shut out of action by hydraulic valves on the inlet and outlet. The atmospheric cooling surface in each battery amounts to 5850 square feet, and the water-cooling surface to 4900 square feet. As each battery is intended to deal with 2,295,000 cubic feet of gas in 24 hours, the condensing surface provided is equivalent to 4·7 square feet per 1000 cubic feet of gas made per 24 hours.

In order to be able to control the temperature of the gas at any time, each of the circular condensers is provided with a thermometer, which extends down into the gas-space of the apparatus. Each condenser has an exposed overflow and condenser seal-pot for the reception of the condensation products which flow away from it. The outlet to the seal-pot leads to a cast-iron pipe, 10 inches diameter, which passes at the back of the condenser battery, and is provided with slot-orifices. The condensation products pass thence to the receiving-tanks. The gas travels from the condensers through mains, 36 inches in diameter internally, to the engine-house, to which it is drawn by the exhausters contained therein.

The engine-house has its axis at right angles to the condenser-house and scrubber-house. It is 112 feet long, and 75 feet wide; and from the floor to the roof-supports, the height is 33 feet. The basement is excavated only sufficiently for the accommodation of the mains; and the floor of the house is paved with figured paving-slabs. Here are fixed the exhausters by which the gas is drawn from the retort-houses and forced through the remaining apparatus. For each system or sub-section, two exhausters coupled directly with the steam-engines by cross-links are provided. As a reserve, there are between each two sub-sections an additional two exhausters, coupled direct with two reserve engines. The exhausters are the three-blade pattern made by the Berlin-Anhalt Engineering Company, which work very uniformly. At eighty revolutions a minute, they pump 85,000 cubic feet of gas per hour. Six steam-engines, each of 20-horse power, are employed for driving the exhausters. Of these engines, two are kept in reserve, as already stated. Each of the engines is fitted with precision valve-gearing, Hahn's governor, and starting mechanism. In order to secure safe working, each sub-section is furnished with a Dessau circulating governor, having inlet and outlet pipes 20 inches diameter. Each exhauster, also, has valves for shutting off both the inlet and outlet pipes; so that it can, in case of failure, be immediately shut out of action.

At the back of the engine-house, and separated from it by a small space, is the boiler-house. This is 107½ feet long, and 67 feet wide. It contains ten boilers with water-tube circulation, each having 1076 square feet of heating surface. These boilers have to furnish the steam required, not only in the engine-house, but also in the ammonia-works, as well as for dealing with the tar, and for driving the air-compressors used for raising tar, acid, ammonia, water, &c. Two of the boilers are kept in reserve. In addition, these boilers have to supply in winter the steam required for keeping in working condition the plant for heating the condenser-house, the engine-room, and the scrubber, purifying, and meter houses.

(*To be continued.*)

# COMMUNICATED ARTICLES.

## CAN COAL FAMINES BE PREVENTED?

In his very interesting Presidential Address to the Southern District Association of Gas Engineers, Mr. Corbet Woodall naturally referred to the subject that above all others has occupied the attention of the industry this eighteen months past—that of the price of coal; and in the course of that reference he remarked "that there were few problems better worth attention than how best to prevent the recurrence of such an experience as the country had gone through during the past year." Mr. Woodall would, indeed, have placed the nation under an everlasting indebtedness, had he presented any solution of the problem propounded. This, however, he did not do, for the very simple reason, I venture to think, that no general remedy which would not prove worse than the complaint—if, indeed, any remedy at all—is to be found. Who will essay to control effectively and without injustice the natural operation of the relation of supply to demand?

Mr. Woodall does, it is true, hint distantly at nationalization of the coal resources of these islands. This, at least, is the apparent drift of his remark, that the country's recent experience "has caused attention to be again drawn to the danger which must attend the control by a limited number of persons of products necessary to the life of a nation." As nationalization of the coal mines has been advocated on many occasions on various grounds, it may be worth while considering whether such a step would be calculated in any degree to prevent the recurrence of periods of scarcity and dearness of coal such as that from which we are now just emerging.

Let us then imagine the mines to have been in the hands of a Government Department in October, 1899, when the fact first became patent that the production of coal was unequal to supplying the requirements of all desirous of buying. Trade was very active at home; and the consumption of coal had greatly increased, and was increasing. Business was also flourishing abroad, and orders for coal were pouring in at all the coal shipping ports, unchecked by the prices asked. What would the Coal Department have done? They could not have increased the output. The law will not permit of raw labour being imported into coal mines; every would-be miner must undergo a preliminary (two years') training. And no one will contend that a Government official would succeed in doing what no colliery manager can do—persuade the men to increase their daily output when they have no mind to do so. The Department would, therefore, have had to determine how to distribute, say, 90 tons among consumers who wanted 100 tons, without raising the price—for it is assumed that the object of nationalizing the mines would be to prevent prices of coal being raised.

How could it have been done? By serving first-comers first? Then the sharp man who foresaw the excess demand would have been in first, asking for all he could find means of removing and storing, in order to hold it and sell at a big profit when the last-comers found there was none to be had at the national coal pit. By refusing to sell for export? Then, again, the speculating buyer would have reaped the benefit the nation had declined. By prohibiting the exportation of coal? Then the shipping trade would have demanded compensation, or have clamoured for nationalization; and the fleet would have been busy convoying all the colliers leaving the coal ports, in order to ensure that the coal they carried was for other British, and not for foreign, ports. This is a fact that the good people who talk so glibly about prohibiting or taxing the coal export trade generally overlook. There is an enormous "coastwise" coal shipping trade done every year; and it would probably show a remarkable tendency to increase if coal exports were interdicted. It is not, indeed, easy to see how the nationalization of the coal mines could be made to result in the regular maintenance of a low price of coal to the actual consumer; while the fact that 750,000 workpeople, of a by no means pacific reputation, would become thereby State employees, should not be overlooked. The probable—the certain—result would be a permanent increase in the labour cost, and therefore in the price, of the ton of coal.

Is there, then, no means of preventing the occurrence of periods of scarcity and dearness of coal? Speaking generally, I should say there is absolutely none; and I do not think Mr. Woodall had gone far with a consideration of the possibilities when he suggested that, if only public interest could be sufficiently intensified, a remedy could be found. But so far as the gas industry in particular is concerned, it does not appear to me that the case is by any means hopeless. Why should not gas undertakings follow the example of many of the iron and steel making businesses in this country and abroad—that, I mean, of buying their own collieries? Not, of course, each gas company its own coal pit; for that would be out of the question. But why not a combination of companies?

To the objection that the statutory powers of gas undertakings would not permit of such proceedings, it may be answered that it is within the competence of Parliament to extend these powers; and good cause could be shown for the extension. Assuming the possession of the necessary authority, would it not be feasible and profitable for (say) the Metropolitan Companies to acquire, jointly, at a period of depression in the coal trade—not, of course, at a time like the present—collieries with an annual output of not more than 3 million tons; the whole of the capital required to receive a fixed rate of interest, and to be provided by the Companies roughly in proportion to their consumption; and the output to be apportioned strictly in proportion to the capital holding of each Company, and paid for at the cost of production, *plus* charge for capital? Any profits derived from the sale of slack and other coals unsuitable for gas making obtained from the seams, would be applied to reducing the cost of the production of the gas coal. The Companies might further acquire their own fleet of colliers, and a number of large-capacity railway waggons, thereby reducing the cost of transit.

This may all sound very fantastic and impracticable to the reader; but are we in this country always to jog along in the old paths that were wide enough for our predecessors? Can we learn nothing from our friends across the Atlantic, who have recently given us so striking an object-lesson in combination for the purpose of cheapening production? It is, at any rate, for critics to show that the suggestion I have made is incapable of being profitably adopted.

## GAS MATTERS IN THE UNITED STATES.

### The Possibilities of American Coal.

During the last two months, I have read and digested, on paper, not less than a score of articles on the coal situation. Certainly somebody is making an awful commercial blunder, and others as great an economic one. This condition of pressure on the supplies can hardly continue without bringing out stocks from unexpected places, as the needs of France conjured five-franc pieces from old stockings. To what degree, and how soon, the coal merchants in this country will enter the world's markets, no man can foreknow. No, nor can he foreguess with any possible chance of getting it right. But it is absurd to talk, and more absurd to write, as if the Pennsylvania coalfield were the only one to be considered.

"Away down South" are men who will be wanting to say no small something on this subject. Few people seem to understand the situation (say) at Wilmington. Take the Cape Fear Company, the one which is represented by Mr. Baylis, I think. This concern controls mines whose possible output is greater than the entire output of Pennsylvania to-day; and it is by no means the only, much less the largest, one. These possible mines would become actual mines to-morrow, if either one of two things happened—a rise of 4s. in the price of coal at the breaker, or a change in the transportation conditions. Up to date, their trade has been purely a local one, barring some small exports for fuel on steamers. Their mines are on the Carolina side of the mountains; while the development has been on the inland—that is, the Tennessee side. Some years ago, I met Mr. Baylis; and he told me then that, given the railroad facilities, his Company could land a coal as good as any in the world for steam making, bar none, as cheaply as could any company in England at any port 1000 miles from the loading point. The matter was discussed at length at the Engineers' Club; and when someone said "miners," Mr. Baylis said: "Gentlemen, you have never seen the negro work, I have." The feeling shown by so many of the contributors to the British papers—that nowhere in the world can coal be produced so cheaply as in England in anything like corresponding quality—is all wrong. The problem is not coal production, but coal transportation. The question is partly one of price, but still more of trade; and if anyone is trusting to the impregnability of the American Chinese wall, I can assure him that it is not masonry, but mud. Besides, if anyone imagines that steamship freights have anything to do with the question, he commits two faults. Coal will not be transported in steamers, but in sailing ships; the largest cargo at the very least price.

It is noteworthy, also, that while some men seem to see there are coalfields outside those of Pennsylvania, no one seems to understand—I mean those writing for New York and London publics—that there are coalfields in this Continent far far away. True, English and Australian (?) coals are better known in San Francisco than those of Pennsylvania; but ——. It is a matter beyond my knowledge where the "Australian" coal is mined; but after it is in the hold of the "four master," 2000 miles more or less will not count for much.

There is also an idea that there is no useful coal between Colorado and the Pacific. This also is a mistake; there are enormous quantities. True, it is by no means the best Pennsylvania anthracite, far less the best Welsh steam coal; but I have specimens from a dozen and more prospect holes which, within a few feet of the surface, were yielding a coal quite equal to much Belgian, German, and French—speaking from the samples on my shelves. No coal carrying 60 per cent. of fixed carbon, with 0·08 per cent. of sulphur, and less than half as much phosphorus, is absolutely worthless, even if it will not make coke, and will persist in burning to a clinkerless ash. Some of these Jurassic coals do swell unconscionably in the process of burning; but those which really fuse are very few. Unfortunately, the fusible coals were those first found; and on the principle of *ex uno disce omnes*, all have been condemned. I have some specimens of "coal" from Utah which would actually fuse to the consistency of tar before they were hot enough to burn; but they were wonderful fuel if properly handled.*

This is no place to discuss such a point; but the heating value was that of the best petroleum, weight for weight. The want of this coal is not B.T.U., but transportation; and, *à fortiori*, a coal of the sort mentioned just before, needs nothing else. Given a way of getting the coals of Nevada, Utah, and Northern New Mexico and Arizona into the market, and something to use them for when they come, and no one will say "there is no coal west of Denver."

The same thing is equally true in regard to Mexico. Every little while I hear some one say: "What a pity there is no coal in Mexico." And if it seems to me worth while, I invite them to look over my collection of Mexican coals. True, I have gathered but few of the specimens with my own hammer, and by no means all have reached me as specimens for my cabinet; by far the larger part were acquired as the spoils from examinations as a chemist and expert. But there are the pieces of coal, and the letters of the men who sent them; and it is hardly likely that a man would send me a piece of coal saying this came from Vera Cruz when it really came from Chihuahua. Granting this to be true, there is plenty of coal in Mexico. It runs from 78 per cent. of fixed carbon to 42 per cent.; from 4 per cent. (rather less, really) of ash to 28 per cent.; and from 0·08 per cent. of sulphur to 1·64 per cent.—once to 3·32 per cent., owing to pyritic geodes. But still all is good, merchantable coal.

Among these many specimens are not a few curiosities which are by no means coal—such as a "sandy shale" which, when thrown on a fire, gives off feet on feet of a gas burning with a beautiful, long, and splendidly luminous flame.

Among the curious minerals containing hydrocarbons may be mentioned one almost identical with the Booneville cannel, except that it contains almost none instead of a large percentage of sulphur. This strange substance holds more than 33 per cent. of hydrocarbons volatile at a red heat or less, and about 50 per cent. of fixed carbon. The rest is a "clay" containing iron oxide and more or less of manganese. It has no more power of coking than has a piece of limestone or chalk; but the intensity of the fire it makes is wonderful. The ash is a fine red powder.

Another curious "coal" is one sent to me from Trinidad—San Jose. This contains about 2 per cent. of water, and is hygroscopic. About 5 per cent. of hydrocarbons can be removed at less than a red heat, and from 18 to 23 per cent. can be obtained by "distillation" or "roasting in a close retort." The residue is not coke in the proper sense, and yet is almost all carbon. Only 7 per cent. is the maximum ash; and the average from a number of specimens is 4·7 per cent. This substance—65 per cent. pure carbon—is said to exist in enormous quantities. Unlike the "Prairie coals," it contains no "charred sticks," but is homogeneous, and has a fracture like resin. The powder is as peculiar as the coal. Instead of the sub-crimson hue of most of the coals of its kind, it has a peculiar steel blue; and the ash in this case also is nearly all of it white and claylike. Sometimes it contains large amounts of iron, but not usually; and none of the specimens which I have myself, nor any of those which I have seen, have any sand in them, as have like coals from Arizona. The widespread notion that Mexico lacks coal is groundless; the real want is a demand to justify someone in raising it.

### The Methods of the "Corporation Striker."

Do you have the "corporation striker" in England? I do not see how you can have this precious exponent of American civilization, because you lack the machines he works with—town councils and State Legislatures. I referred to the misdoings of one of them in a previous letter; but the case was not one calling for much admiration. Another, however, has come into prominence, which lacks only one item—success—to make it typical.

The best examples of this genus are to be found *ultra montes* in Ohio, Indiana, Illinois, and Kansas. But once in a way they wander to the South in search of new pastures. They must find an abundant field for their peculiar talents; for they seem quite well to do, and have plenty of money to spend in buying sealskins for the wives of impecunious legislators with easy consciences, and sometimes for the purchase of diamond studs for the legislators themselves. These men have many ways of plying their nefarious trade; but they have only one argument—at least, they use but one—a piece of yellow metal, which is said to be an irresistible talisman for convincing a legislator of minor degree that they (the striker and his legislator confederate) are the only true friends of the people.

Just now, the special victims of these men are the gas companies in the States of Ohio and Indiana; but they have been working in the North-West for the last few years. The *modus per quem* for some time past has been as follows: Going into a town which has a gas company just beginning to pay, an idle attorney, and a beggarly sheet called by charity a newspaper, the man hires an office. Presently, the paper begins to publish letters complaining about the quality of the gas, then about the price. This continues for a while, and then letters about the profits of such enterprises begin to appear. Usually the men in charge of the company's interests know the value of silence; but some unwise stockholder, or some indiscreet friend heedlessly angered, contradicts these statements over his own signature. The purpose of the ruse has succeeded. Someone has taken the bait; and now a furious controversy is begun in the newspaper. Letters are sure to appear, sent through the Post Office always, signed by names no one would find among the lists of voters or taxpayers—in point of fact, these are usually searched to be sure that the names are not there. By the persistence of the newspaper, a real controversy is usually called into existence between two sets of people who know nothing, and care less, about the gas company—probably do not even know the names of the president and of the board of directors—but who are much interested in the general question of "corporations with *quasi*-public functions." One faction assails the company on principle, and the other defends it. Presently, some local debating society in the public schools usually tears the resolution, "Resolved that industries employed in public functions are better managed by private than by public service," into absolute rags. The resolution always takes this shape of defending vested interests; and the negative somehow always comes out on top—at least, the judges make this the winning side—and equally, almost or quite always, the attorney, the editor, and the promoter are seen in the distance and the fog.

Then the vortex widens. Discussion of the doings of the gas company is not permitted to cease, or even to grow less. On the contrary, all the means of public agitation are set going. Plainly all this costs money. These blackmailing syndicates have it to spend. Therefore it is fair to suppose this form of blackmail in some way pays for the game.

But now the agitation, so painstakingly started, goes alone. The reputable newspapers almost unconsciously are drawn into the whirl in simply taking note of passing events. Next the churches (*sic*) echo with the noise. One preacher denounces covetousness, and uses the greed of the gas company to point his moral; another makes his text "Thou shalt not steal," denounces men who would rob their neighbours of their legally vested rights, and with the gas company adorns his tale.

Suddenly "The People's Mutual Gaslight Company" is organized. The idle attorney, the venal editor, and one or two aged (always) and respected (almost always) citizens make out the legal number and file the legal papers. No one has put up one nickel; the promoter "representing New York capitalists," so the paper of the venal editor announces, "having attended to all needful expenditure." If by chance, as in some States, a few dollars must be put up by the incorporators, this statement about the "New York capitalists" may take another form; but the onus of the deed always falls on these anonymous absentees.

The next step is a battle for the franchise—the right to occupy the city streets. If this is denied to the strikers, then all their labour and all their money has been expended in vain and foolish buffetings. Now the vested interest prepares for battle in terrible silence; but its preparation is very real, and both sides begin to marshal their forces and count their spare coin.

Now the beauties of local self-government appear. The battle may be in the State Legislature—it will, maybe, get there in time; but usually the city's legislature, the common council, is the field of battle. The right to use the city streets rests primarily with the city; and the Legislature will not be appealed to usually, in most of the States at least, until later.

The new corporation petitions for the right to use the streets. This is the first move. The member who has agreed, for stock or other valuable consideration, for obvious reasons not stated, to "see the ordinance through the council," introduces his measure; and it is put upon its passage. Perhaps because spoils are suspected, perhaps from a scintilla of common sense or common justice, or some reason personal and potent, another local legislator intervenes; and the ordinance is tabled, or sent to committee, and must wait. The fight is on in deadly earnest now. Every argument understood by the American mind and purse is used; and in the final issue, it becomes simply a question of price—not always, but usually it is said, price in hard dollars.

The last day comes for all things; and the attorneys for the two parties—the would-be robbers and the would-not-be robbed—see to it that every man is in his seat or is paired. The ordinance is put upon its passage, and usually is passed; because the would-be robbers dare to promise more than the would-not-be robbed, as the robbers never expect to pay the bill, and the others know that their promises will have to be redeemed. Usually the robbers win. My data are quite voluminous, and show the robbers' chance of passing the common council, or its equivalent, is as seven to three. But there is one more danger—the Mayor may veto. Already the charge of bribery and the threat of Grand Jury, is in the air. He may have promised; but he hesitates. Something has come to him. Is it the wee, small voice, or is it the potent silence of gold? No one will ever know. But he orders a hearing. Let the interested parties appear before him and say why he shall or shall not sign. He hears them in public; but he may grant interviews in private. He was to sign at once; but he does not—he waits. Will he let the ordinance go by default? So whisper the plotters to each other to keep up their own hopes; for they know that this delay bodes their plans no good. The Mayor returns the ordinance vetoed at the last possible minute—at least, the chances are just nine to four that he will do so. The sense of responsibility which is divided and lost in the council is unbroken here; and the individual conscience cannot carry the load, with the spectre of a man in striped clothing of no particularly handsome fit in the distance.

Such is the history in a little more than a bare majority of the cases. But suppose the robbers secure their point, and the ordinance is carried. Then begins a comedy which may suddenly turn to farce or even to tragedy. The plotters have no more use for their franchise than Falstaff for a sword—that is, for the use for which such things are legitimately employed. They want to sell it,

not to use it; and in their late victim they think they see the buyer. Sometimes they do; and in the aftertime the men who took the bribe find themselves indeed the slaves of a master they never intended to serve—made so by proof whose dread power over their future they know only too well. Sometimes the franchise remains an asset of the promoter; and some few times such franchise has been put to legitimate use. Have you the "corporation striker" in England? Or is he peculiar to the States? This is no fancy picture; but a statement of sad facts. Were it but possible to get *all* the facts from those interested in, for instance, the recent proceedings in Atlanta, Georgia, the picture would probably be wanting no element to prove that every detail of my generalization was strictly true.

### The Devonport Gas Company's Case.

It is a notable interest which is being taken by corporation lawyers in the Devonport Gas Company's case. A number were discussing it at the Club the other night; and the opinion seemed to be universal that the case was an important one for this side, as showing what might be expected were laws analogous to those in force in Great Britain to be enacted here. Two ideas brought out by arguments of the lawyers seemed to cause them surprise. One was that an advocate should admit a deed outside the rights of the corporation, and admit in Court the knowledge and intention to obtain legislative sanction afterwards for the act; and the other that the Court should take into account a possible or probable, but certainly contingent, act of the legislative function in such connection. It may be they did not understand the case; but here, I am told, the Courts frown with at least three wrinkles, and sometimes with four, on acts of corporations taken to be *ultra vires*. The necessity for keeping a very close watch on corporations with public functions, is admitted here; but they seemed to feel that it was giving the fox the geese to keep to let an irresponsible person bring any such action against a public company, unless surety was given that the company should not be injured thereby, as they easily might be, as seems to be feared in this very action.

### English and American Illuminating Power.

In my last, I referred to a notice of the difference between English and American illuminating gas as seen by one College Professor. Since writing, I have looked up the matter, and have found the following in a recent book—"Engineering Chemistry," an elaborate book by a certain Professor Thos. B. Stillman, M.Sc., Ph.D., of the Stevens Institute (the great Technical School across the North River), in which he professes analytical chemistry. He says (page 171): "The coal gas of London, England, with an illuminating power of 16 to 17 candles, has a calorific power of about 668 B.T.U. per cubic foot, and costs 60 to 70 cents per 1000 cubic feet. The average of numerous tests, made with the Hartley calorimeter, upon the New York City water gas gives 710·5 B.T.U. per cubic foot. One thousand cubic feet of this gas, costing $1·25, would therefore yield 710,500 B.T.U., equivalent to 568,400 B.T.U. for $1." These differ a little from the Ohio man's figures. If the reduction of price rumoured goes into effect, the result will figure out as follows: The New York man will pay $1 for 710,500 B.T.U., and the London man will get 954,300 to 1,113,350 B.T.U. for his $1. Yet there are some audacious individuals who do not hesitate to tell us how high priced, and how wretchedly bad, is the London gas. It would be a good plan for these growlers to come to this city *omne ignotum pro mirabile*. They would learn a few things. This great difference in the heating capacity per cubic foot may account for the greater comparative success in the use of incandescent lights. Even 6·63 per cent. counts if all the heat is used in the mantle. This is the true difficulty. Not above 12½ per cent. of the exhibited heat has ever been used, even experimentally; and then the ordinary mantle is said to have exhibited better than 100-candle power. Unfortunately, those who made the experiment were unwilling to give any useful details; so a critical examination of their results has practically been impossible.

### Massachusetts Law and Gas Securities.

The influence of the Massachusetts law on the value of Massachusetts securities was illustrated in a peculiar way recently. An Iowa Corporation proposed to buy a number of gas manufactories, and raise some money for extending them on bonds, and also to offer the stock for investment. To make this thing less difficult, these men, all from Iowa, put themselves to the trouble and expense of incorporating under the Massachusetts law, so that their securities and accounts might have the advantage which the supervision of the Massachusetts departments would give. This seems to show that this "oppressive, unrighteous, and foolish legislation" has uses—even for its victims.

### Gas Companies and Payments to City Funds.

You may note that in the "American Gaslight Journal" a number of companies are reporting the sums paid to the city as the city's share in the partnership. This is one of the anomalies we see about us everywhere in this land of great liberty and little freedom. The increased dividend-paying power of these companies is wholly due to the non-taxpaying portion of the consumers—the flat renter and small tenement householder. These are they who increase the earnings and the dividend, not the owners of the freehold. Yet, under the present partnership, they, while helping to pay the taxes by burning the gas, are profited not a tittle. The arrangement, however, works substantial justice; for they are only paying indirect taxes. They pay a little more than they should for gas; the balance goes to the City Treasury, and lessens the taxes of the owner of the tenement. If it is objected to, the answer usually given is: The tenant, equally with the owner of the freehold, needs police protection, fire protection, water supply, and streets. Of these, he pays directly for water only. Why not for the rest, even if it be indirectly? Such is the American argument; and, in a way, it is quite unanswerable.

### Municipalizing Gas-Works.

The "Journal" for Jan. 22 has proved as interesting to the lawyers as did the previous one. I found the same four men who were discussing the preceding number reading that one last night. They seemed to think the cost of taking over the gas-works by the municipality augured ill for the taxpayers.

### American and English Gas-Fires.

Mr. Thos. Fletcher's letter, about the use of gas for heating, causes much amusement here. One manufacturer said to-day: "Either Mr. Fletcher under-estimates the intelligence of the people, or else the statements by men who know business when they see it must be untrue. No doubt the amount of air heated per B.T.U. is greater under the conditions Mr. Fletcher names; but the amount of heat given off is greater when the surface is white hot." In this, he is quite right. The difference in radiation from either "logs" or "pumice" is between 64 and 81 times greater when the pumice is white hot than when it has just begun to redden. If Mr. Fletcher will take the trouble to experiment, he will find that white-hot pumice radiates 2·347 times as much heat as the same weight of white-hot coal; and the number of B.T.U. given off by the gas is considerably less than that given off by the burning coals. In fact, if the measure be made the number of B.T.U. supplied by the fuel and the number received at 10 feet distance on a square foot of surface, he will find the efficiency of the gas-fire is to the efficiency of the coal-fire almost exactly as 25 is to 16. Indeed, the efficiency of the pumice gas-fire is, I think, universally admitted.

It seems very odd that the man who invented the gas-stove should have been the man to say that the first invention was the best. Here the medical men, without any hesitation, say that the air in a room should never be raised above 70° Fahr.; and they also strongly advise the use of the open fire and flue for ventilation purposes, and especially for the exceeding great comfort given by the radiant heat as opposed to a heated atmosphere. When doctors disagree, the patient must decide; and here the patient decides in favour of the "gas-log" for first choice and the "pumice-fire" for second—probably because it is less known. Mr. Fletcher said people wanted the fire to look warm. I fancy if he had a grate 18 in. long by 6 in. wide on the floor and 12 in. high, filled with white-hot pumice, he would decide that it was warm enough "to look warm," as well as to heat the room; and the "long, bright flame" is a thing *not* desired here.

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**Smoke Abatement Society.**—Since the formation of the Smoke Abatement Society in March, 1899, no less than 2700 observations have been made by their inspectors on smoking chimneys in various parts of London. Offences have been proved in 162 cases, and penalties have been inflicted amounting altogether to £750, of which many have been of small amount.

**Improved Working of Gas-Driven Tramcars.**—The gas-driven cars of the Blackpool, St. Annes, and Lytham Tramways Company, Limited, received some time since occasional mention in these columns; and one of the latest references announced the probable displacement of the gas-motors by electric traction. But information received last week inspires the hope that this change may not now come about. In 1900, the Company obtained an Act which empowered them to run at the rate of 12 miles an hour, to double the line, and to convert the system to electrical working. Until, however, such time as the conversion was decided upon, the Directors were anxious to effect what improvements they could on the present cars—mainly in the direction of increasing their speed. The General Manager (Mr. Lewis Slattery) appears to have entered into the matter of improvement very heartily. At the request of the Directors, he first experimented with one car; and the result was so satisfactory that the Directors determined to have the whole of the cars speeded up. The outcome is that during the past winter four cars have run more mileage than the six that were previously necessary to work the service; and this has enabled Mr. Slattery to reduce the staff by two drivers, two conductors, and one car cleaner. The consumption of gas per mile is also less than under the old conditions. During the time the cars have been working at the increased speed, the consumption per mile (including the lighting and heating of buildings, lighting of cars, compressing gas, and the driving of cars) works out to 0·90d.; whereas for the same period in the previous year the cost was 1·05d. The smell of gas inside the cars, which hitherto has been one of the chief objections to the system, has been materially reduced. The only objection now is the pitching of the cars consequent on the increased speed; but Mr. Slattery is at the present time experimenting with some new springs to reduce, if not entirely obviate, the rocking motion. It may be of interest to readers to know that the through traffic is practically double that of last year; and Mr. Slattery's opinion is that the bulk of the increase is due to the reduction in the time expended on the journey.

# TECHNICAL RECORD.

## PROFESSOR LEWES'S LATEST PATENT.

Those who were fortunate enough to hear Professor Vivian B. Lewes's lecture before the Institution of Gas Engineers last May, as well as those who subsequently read the lecture when reported in the "JOURNAL," may remember that towards the end of it the lecturer made some very pointed allusions to an alteration of modern coal carbonizing processes which he suggested would lead to extraordinarily favourable results. He concluded in these words: "I think you will agree with me that if this modification of the process of distillation will enable you to make 13,000 to 14,000 cubic feet of gas per ton of coal of the same, or 1 candle better, quality than you are now producing, and with the increment in volume only costing 3d. to 4d. per 1000 cubic feet, a step of the most enormous importance will have been taken, while any further increase of illuminating power that is needed can easily be obtained by merely benzolizing the gas." The arrangement thus referred to is the subject of a patent which was applied for a few weeks before the lecture was delivered, and the specification of which was issued by the Patent Office last week. In view of the importance attaching to the invention, we give a full summary of the specification filed. It should be remarked that there are no drawings accompanying the specification.

The claims made for the invention are: 1. In the manufacture of gas by the distillation of coal, preventing or lessening the decomposition within the retort of the gases given off from the coal by accelerating their rate of flow through the retort. 2. Injecting a gas into the retort during the distillation of the coal for the purpose described. 3. Heating the gas to be injected to approximately the temperature of the retort gases before it is discharged into the retort. 4. Apparatus for carrying out the invention described—comprising a pipe leading from a gasholder and provided with a regulating valve; the pipe entering the retort at or near the mouthpiece, and extending along the crown to the opposite end, and having one or more openings in it.

The specification (which, as has already been remarked, is not illustrated) proceeds: In the production of coal gas by the destructive distillation of bituminous coal, the hydrocarbons produced by the action of heat on the coal are afterwards subjected to radiant heat from the sides and crown of the retort, and also to intense heating by contact with the surface of the retort. Decomposition of the gases results; a large volume of tar and retort-carbon being formed, and the illuminating value of the gas depreciated. The amount of this decomposition varies very considerably according to whether the gases are evolved from the coal near the mouth of the retort or from that farthest from it; as, in the former case, the gas is hurried out of the zone of heat by the evolution of gas from the coal beyond it, while the gas evolved farther away from the mouthpiece has a much slower flow and a longer travel through the heated retort.

According to this invention, the decomposition is wholly or partially prevented by increasing the rate of flow of the hydrocarbon gases through the retort, especially at those portions farthest from the mouthpiece. This acceleration is produced by the injection into the retort of a diluting gas of a kind which will be consumed with the produced illuminant, or which may be easily separated from it. The diluting gas should also be one which is not liable to be itself decomposed by the heat of the retort or to leave residues interfering with the process. Gases such as hydrogen, carbon monoxide, or a mixture of the two—such as water gas—may be mentioned as suitable; and their use, according to this invention, "lessens the formation of naphthalene and retort-carbon, improves the quality of the tar, and effects a great economy in the manufacture of the gas."

If water gas be used, it is preferably produced (says the patentee) in a generator of the Dellwik-Fleischer type, and is stored in a relief-holder from which supply-pipes are led to the retorts. In one method of carrying out the invention, the pipe conveying the water gas is controlled by a valve, and passes through the top of the mouthpiece of the retort or through the ascension-pipe, and is then led along the interior of the retort close to the crown; or the pipe may be laid in a channel in the wall of the retort, so as not to interfere with charging the retort with coal or drawing the coke.

At a suitable distance from the mouthpiece, this pipe is provided with openings which are conveniently spaced about 6 inches apart, and so situated that the diluting gas is blown round the walls of the retort. The pipe, which extends to the point of the retort farthest from the mouthpiece, is left open at the end.

The dimensions of the pipe and valve are preferably such that, under the pressure existing in the holder, it shall be capable of passing a volume of gas equal to approximately 50 per cent. by volume of the gas-yielding power of the coal in the retort during the period taken for carbonization. With a rich cannel coal, up to 50 per cent. of water gas may be used with advantage; but with ordinary gas coals, 25 to 30 per cent. will probably be found an economic limit.

It is important that the diluting gas should be at as nearly as possible the same temperature as the gas being evolved from the coal; and this result may conveniently be attained by leading the supply-pipe down the interior of the retort, or through portions of the furnace space. Other means for heating the diluting gas may, however, be employed.

The gas used should be free from steam, which "causes an increase in the percentage of carbon dioxide present, increases the expense of purification, and lowers the illuminating value of the gas, by decomposing some of the heavy hydrocarbons."

If desired, the patentee remarks in conclusion, the diluting gas may be passed into the coal itself, so that the current will not only carry away the generated gas which has already arisen above the coal charge, but will also drive out any that may be held in the interstices of the coal. The arrangements described are, however, preferred, "since they do not interfere with the charging and discharging of the retorts, and also provide means whereby the diluting gas is introduced at a high degree of temperature."

## BOSTON (U.S.A.) COKE-OVEN GAS PLANT.

(*Concluded from p.* 753)

### Advantages Claimed for the Otto-Hoffmann Process over other Gas-Making Processes.

The processes which are employed for the manufacture of gas in large cities can be grouped under three heads: 1. Coal-gas plants. 2. Water-gas plants. 3. Combined coal and water gas plants.

*Coal-Gas Plants.*—In the coal-gas plant the gaseous constituents of bituminous coal are driven off by destructive distillation, and (after proper purification and, eventually, enrichment) are sold to the consumers. The ordinary coal-gas process is too well known to require description. It is evident that the improved Otto-Hoffmann process, as described, belongs to this group; but there are the following chief points of difference between it and the ordinary gas-house process:—

*a.* The Otto-Hoffmann oven holds about 12,000 to 14,000 lbs. of coal per charge; while the ordinary gas-retort holds only about 300 to 400 lbs.

*b.* The operations in the Otto-Hoffmann process are almost entirely done by machinery. Even the modern improved gas-retorts (Coze inclined retorts) depend to a great extent on manual labour, and have consequently a high labour cost.

*c.* The Otto-Hoffmann coke is of a quality suitable for metallurgical purposes; while the market for ordinary gas-house coke (owing to its poor physical structure) is limited, and offers a much lower price. All the coke produced by the Otto-Hoffmann process is available; the gas-house uses a part of the coke for heating the benches.

*d.* The improved Otto-Hoffmann process uses the poorer part of the gas for heating the ovens, and makes only the first rich fraction available—thus reducing enriching to a minimum, or avoiding it altogether. In the ordinary gas-house process, all the gas produced is sold; it is of lower candle power, and consequently requires more enriching.

*e.* Owing to the fractionate separation of the gas, which sends only the richer parts of the gas to the city, the Otto-Hoffmann process does not limit itself to the use of high-grade gas coals, which are expensive, but which are necessary for the ordinary gas-house practice. Poorer coals can be used, provided only that they yield a marketable coke; because the first fraction of the gas is in many cases even richer than the average gas from high-grade gas coals.

*f.* In the Otto-Hoffmann oven, the carbonization of the coal is performed at an expenditure of much less heat than in the ordinary gas-retort practice (see the "Heat-Balance" given further on).

*g.* The yield of bye-products from the same coal is much higher in Otto-Hoffmann ovens than in ordinary gas-retorts.

A comparison of the efficiency of the ordinary gas-retorts and the Otto-Hoffmann ovens is as follows:—

| The heat contained in 100 lbs. of dry coal is distributed as follows:— | Per Cent. of Total Heat Value of Coal. | |
|---|---|---|
| | German Coal in Gas Retorts.* | International Coal in Otto-Hoffmann Ovens. |
| In coke suitable for sale | 46·4 | 72·3 |
| In coke used for heating retorts | 10·1 | .. |
| In tar | 5·5 | 4·1 |
| In gas (saleable) | 21·0 | 12·7 |
| In gas for heating ovens | .. | 10·7 |
| In ammoniacal liquor, sulphur in purifiers, and loss | 17·0 | 0·2 |
| Total | 100·0 | 100·0 |
| Heat used and lost in the distillation process | 27·1 | 10·9 |
| Heat contained in the products | 72·9 | 89·1 |
| Total | 100·0 | 100·0 |

* W. von Oechelhaeuser, *Die Steinkohlengasanstalten als Licht, Waerme, und Kraftcentralen*; Dessau, 1893.

*Water-Gas Process.*—The principle of it is to heat a mass of fuel (generally coke or anthracite) to a high temperature by burning a part of it in an air-blast. Subsequently steam is blown over

this glowing fuel, which results in decomposition of the steam, and the formation of a mixture of hydrogen and carbon monoxide (blue water gas). This, then, is enriched by oil gas obtained by the gasification of naphtha by means of the waste heat produced during the heating of the mass of fuel.

The heat economy of this process has been exhaustively studied by Mr. A. G. Glasgow (see his paper read before the American Gaslight Association, October, 1890*). From these investigations, we learn that, in the manufacture of the "blue gas," the energy of the fuel is utilized as follows:—

| | |
|---|---|
| Energy utilized—*i.e.*, contained in the blue gas | 61 per cent. |
| Energy wasted | 39 ,, |
| Total | 100 |

A part of the wasted energy is subsequently utilized in the manufacture of the oil gas, by which the blue gas is carburetted. This amounts to 20 per cent. Consequently, in the manufacture of the carburetted water gas, we find—

| | |
|---|---|
| Energy utilized | 81 per cent. |
| Energy wasted | 19 ,, |
| Total | 100 |

Mr. Glasgow confined his calculations to the utilization of the energy introduced by the coal and oil in the Lowe water-gas setting. His basis of calculation is the amount of carbon actually gasified in the generator, which amounted to 23·5 lbs. of carbon per 1000 cubic feet of 31-candle power carburetted water gas.

In order to determine the efficiency of the water-gas system as a whole, I have to take into account the amount of carbon lost in the ashes of the generator and the coal required for making the steam for the generators and for other uses in the plant. Mr. Glasgow gives these data in a paper read before the Cleveland Institution of Engineers in January, 1897.† He says that 1000 cubic feet of 24-candle power water gas can be made from 40 lbs. of coke, including boiler fuel. We will assume that 1 lb. of coke = 12,500 B.T.U.; or a total of 500,000 B.T.U. Furthermore, 3·5 English gallons of oil are required, from which the tar produced should be deducted. This would leave 25 lbs. of oil at 20,000 B.T.U.; or a total of 500,000 B.T.U. The gas produced has 24-candle power. A gas of 28-candle power is stated to have 708·9 B.T.U. We may place, therefore, the 24-candle power gas at 700 B.T.U. We would thus obtain the following approximate heat-balance of a modern carburetted water-gas plant:—

*Water-Gas Process Heat Balance.*

| | |
|---|---|
| Energy in coke used | 500,000 B.T.U. |
| ,, ,, oil ,, | 500,000 ,, |
| Total energy | 1,000,000 ,, |
| Energy in 1000 cubic feet of gas | 700,000 ,, |
| Energy utilized | 70 per cent. |
| ,, wasted | 30 ,, |
| Total | 100 ,, |

*Combined Coal and Water Gas Plant.*—These have increased quite considerably in number during recent years, and naturally so; because, in making extensions, existing gas-works found it advantageous to add water-gas settings to their coal-gas benches in order to find use for their coke. The efficiency of these plants is determined by the percentage of the two constituents in the gas mixture; but a number of less important features tend to slightly increase the efficiency. As a part of the coke coming from the retorts is used in the generators, the quantity of disposable coke is decreased.

### Comparison of Chief Gas Manufacturing Processes.

In order to convey a clear idea of the relative results of the different gas-producing systems, I shall add two tables. These should be considered as approximate only, and solely intended for the purpose of illustrating the difference in the processes. For each locality the data will change more or less materially.

*Efficiencies of Gas-Making Processes Compared.*

| Process. | Energy Wasted. | Energy Utilized. |
|---|---|---|
| I.—Carburetted water-gas process | 30·0 | 70·0 |
| *Carbonization of Coal.* | | |
| II.—In gas benches (good practice) | 27·1 | 72·9 |
| III.—In gas-benches (poor, but common, practice) | 31·2 | 68·8 |
| IV.—In Otto-Hoffmann ovens | 10·9 | 89·1 |

*Products of Manufacture (per 1000 Cubic Feet of Gas) Compared.*

| — | Carburetted Water Gas. | Coal Gas, Good Retort Practice. | Improved Otto-Hoffmann Practice. |
|---|---|---|---|
| Candle power of gas | 24 | 14 | 18 |
| Coal or coke consumed | 40 lbs. coke | 224 lbs. coal | 448 lbs. coal |
| Oil consumed | 30 lbs. oil | .. | .. |
| Coke | .. | 110 lbs. poor | 315 lbs. good |
| Tar | 0·5 galls. | 1·12 galls. | 2·25 galls. |
| Sulphate of ammonia | .. | 1·80 lbs. | 5·50 lbs. |

The enriching of the coal and Otto-Hoffmann gas has purposely been disregarded, because this can be done in various ways.

The above figures will make the gas engineer's hair turn grey if there be any left. He will at once predict failure to the process, as he still vividly remembers the difficulties he had to overcome in disposing of the "bye-products." Here the quantities of these bye-products are increased to formidable figures. He makes only *one* mistake—as old as the coal-gas industry itself; he calls coke a bye-product. It is not a bye-product. Coke is, or should be, the *main* product of the destructive distillation of coal, because it is the largest in quantity and value. Wherever a city consumes large quantities of coke, or where a market can be made for a high-grade coke, there the Otto-Hoffmann has its place. Why? The coal (say, 1·4 tons) that has been used in the manufacture of 1 ton of coke can be transported to the city just as cheaply, or cheaper than, the ton of coke. The latter is bulky and requires special cars, which mostly return empty. Now, all this coal can pass through an Otto-Hoffmann plant, which converts it into coke very much cheaper than is done in the beehive ovens, almost exclusively used in this country. Thus a crude gas of high candle power is obtained as a real bye-product, inasmuch as it costs practically nothing. In other words, in these instances the manufacture of a high-grade coke and saving of tar and ammonia, is in itself a profitable business, even when the gas is thrown away. Only a small expense is to be charged against the gas—viz., the cost of purification and eventually enriching.

The process enables the sale of gas at such low figures, especially for heating and for power, that an enormous development in these lines may be expected.

There are a great number of cities on the European Continent which sell now between 35 to 48 per cent. of their entire gas output for heating, cooking, and gas-engines. This shows that, with proper prices, gas-works may double their output. The near future will increase the demand for gas for other purposes, so that the illuminating feature will cease to be of prime importance; and then the gas-works will become what they ought to be—central stations for light, heat, and power.

We then will also look upon the question of candle-power from a different standpoint. Not the illuminating value, but the fuel value will become the criterion for the quality of the gas, especially since the ever-spreading adoption of the incandescent lamp. We have no doubt but that the Otto-Hoffmann oven will play an important part in these developments.

### Conclusion.

It remains to state that the introduction of this youngest scion of the gas industry has not been an easy one. Anyone familiar with the Pandora-box called the Boston gas interests can imagine what amount of misrepresentation and of calumny were heaped on this enterprise. But its originator, Mr. H. M. Whitney, never faltered. His path has not been smooth; but—*per aspera ad astra*.

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**Lead in Potable Water.**—Writing in the "Journal de Pharmacie et de Chimie," M. Cables points out that pure lead is attacked by waters less readily than alloys, and the ease and rapidity of the attack increase not only with the amount, but also with the number, of the foreign metals. The author's experiments with long lengths (about 100 feet) of lead piping confirm the usual view, that nitrites in the water increase its corrosive action on lead, while most other salts diminish it. Free carbon dioxide, as a solvent of lead carbonate, also increases the activity of a water; but the addition of dissolved calcium carbonate, especially in conjunction with calcium sulphate, greatly lessens it. Lead in a water is best detected and its amount determined by hydrogen sulphide; but care must be taken to have enough acid to dissolve any carbonate present, yet to avoid unnecessary excess, as the coloration produced by a given quantity of lead is considerably lessened by even a small amount of acid in excess. The author is of opinion that in very few cases is lead in water a serious danger. In a domestic supply, filtration—especially if a weekly spoonful of animal charcoal be added to the filter—will usually remove the lead; but in the case of public drinking fountains, he says lead pipes ought to be avoided altogether, and cast-iron ones used.

**Reorganization of the Providence Gas Company.**—At the recent annual meeting of the Providence (U.S.A.) Gas Company, some important changes were made in connection with the management of the undertaking. Mr. Royal C. Taft, who had been Governor since 1893, declined re-election; and the vacancy thus caused was filled by the appointment of Mr. J. W. Ellis. Mr. Alpheus B. Slater, who had been in the service of the Company since 1853, and had held the position of Secretary and Treasurer from 1870, relinquished these offices, which were entrusted to Mr. William P. Nye, the Chief Clerk; while Mr. Robert H. I. Goddard was elected to fill Mr. Slater's place on the Board. The Vice-President of the Company is Mr. William Goddard. Mr. Slater has explained to an interviewer that the Directors some time ago decided upon a reorganization of the Company, and his retirement was the result. The new President, who is a civil and consulting engineer by profession, has been upon the directorate for a year. Under his supervision, the 16-inch main beneath the Seekonk, connecting Providence and East Providence, was laid; and he recently had in charge the rebuilding of the foundations of one of the Company's holders. He was Engineer of the Woonsocket Water-Works, and is a member of the American Society of Civil Engineers, of the Boston Society of Civil Engineers, and of the New England Water-Works Association. He has explained to an interviewer that the reorganization is not due to any lack of prosperity—the Company paying an 8 per cent. dividend, and their $50 stock selling at $98 and $100—but simply to a desire to bring their business methods up to date.

* See "Journal," Vol. LVI., p. 1338. † *Ibid.* Vol. LXIX., p. 124.

# REGISTER OF PATENTS.

**Gas-Burners with Bye-Pass Arrangement.**—Farmer, J. P., of Portland, Oregon, U.S.A. No. 3284; Feb. 19, 1900.

This invention relates particularly to gas-burners in which is included a pilot-burner with automatic means for controlling the passage of gas through the bye-pass to the pilot-burner, so as to prevent needless escape of gas, and yet secure a flame sufficient to ignite the main burner when required. A further object of the invention is to provide an arrangement for opening and closing the bye-pass by means of the key which controls the supply for the main burner—this regulating-key being constructed so that, as it turns, it opens first the main supply and afterwards the bye-pass; and, when released, it will close the bye-pass, and permit the main burner passage to remain open. The several ways in which the patentee proposes to effect his purposes are not further alluded to in his specification apart from nearly six pages of print with hundreds of letters referring to three sheets of closely-packed diagrams. There are 19 different claims for novelty.

**Treating Ammoniacal Liquors and Making Sulphate of Ammonia.**—Scott, E. G., of Talbot Court, E.C. No. 3987; March 1, 1900.

This process for treating ammoniacal liquors consists in heating the liquor under vacuum by means of open steam, conveying the mixed steam and ammonia vapour into a vessel under the action of a vacuum and containing a solution of sulphuric acid and ammonia sulphate, and then collecting the solid sulphate of ammonia formed.

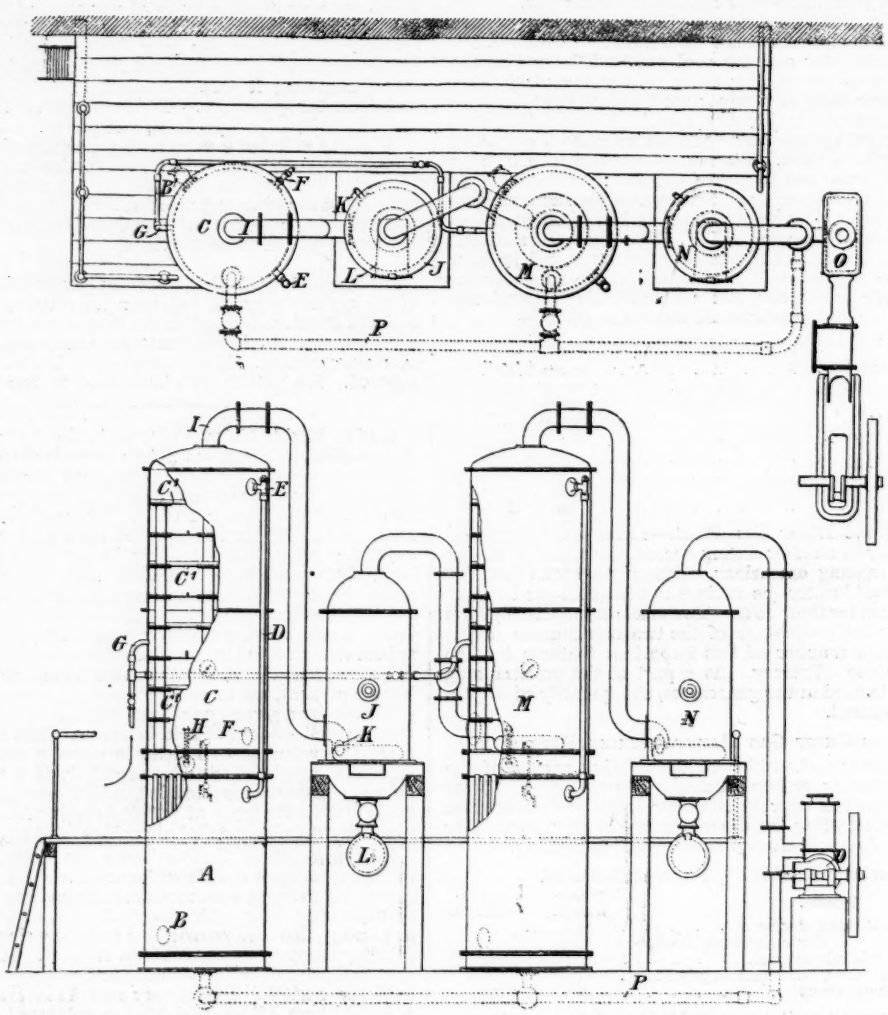
The illustration shows a plan and a sectional elevation of the plant employed.

The ammoniacal gas liquor is pumped into the heater A at the inlet B, and is forced through it to the bottom of the vessel C. On arriving at the upper part of the heater, the liquor passes up by the external pipe D through a spring relief-valve E into the top of the vessel C, which is arranged as an ammonia still, and which is under the influence of a vacuum. The liquor then passes down over and through the plates $C^1$ in the vessel C, running from one to the other, and meeting a current of steam which causes the free ammonia to be driven off, and which is supplied through the inlet F at the bottom of the vessel C into a coil (not shown). As there is a partial vacuum in the still, the steam may be exhaust or waste steam.

The spring relief-valve E is fitted in the pipe D, to prevent the formation of ammonia vapour in it from the effect of the vacuum. Were vapour formed, the patentee points out, it would interfere materially with the circulation of the liquor through the pipe.

When the liquor contains carbonate and sulphate of ammonia, lime or soda is injected through the inlet-pipe G. This lime or soda mixes with the partially freed liquor, and causes the fixed ammonia to be given off.

The liquor continues its passage down the still C, until it arrives at the bottom section, in its passage to which position it has been boiled by the steam rising from the lower layers, and on arriving at the bottom is free from ammonia. It then flows through the bottom plate of the still into the heater A, down the tubes of which it travels steadily; meeting the cold liquor which is being pumped in around the tubes through the inlet B as already described. By this means, the boiling




liquor is gradually cooled; and the cold liquor is slowly heated. The waste heat from the liquor is also saved; the incoming cold liquor leaving the heater almost at the boiling-point, and the outgoing hot liquor passing away almost cold—so that comparatively very little steam of any kind is said to be necessary. The natural tendency of heating and cooling liquors is observed, because the hot liquor as it grows colder is descending and the cold liquor as it grows hotter is ascending—thus avoiding the formation of counter-currents which would be created if the heating and cooling liquors did not pursue these paths.

The mixed ammonia vapour and steam generated in the still pass over from the top, through the pipe I, into the smaller vessel J, made of material suitable for resisting the action of sulphuric acid—copper, lead-lined iron, &c. This vessel contains sulphuric acid and sulphate of ammonia in solution; and as the ammonia comes over, sulphuric acid is run in through the acid inlet K, thus keeping the ammonia constantly neutralized, and preferably, generally, on the acid side.

Sulphate of ammonia is, of course, immediately formed; and, as the solution is saturated, solid sulphate is thrown to the bottom of the vessel, and drawn off from the influence of the vacuum which is maintained therein, either continuously or from time to time by the discharge apparatus L of any suitable design. The "combination vessel" J is under the influence of a slightly higher vacuum than the first vessel; the difference of degree being that required to draw the steam and ammonia through the small layer of sulphuric acid and sulphate of ammonia in the bottom of the vessel. In ordinary work, this is said to amount, as a rule, to a difference of about 2 inches of mercury.

Although the ammonia is arrested in this vessel, the steam passes on from the solution which is always boiling. In addition to this steam, still more is produced by the very large quantity of heat generated by the combination of the sulphuric acid with the ammonia. The extra water required for this steam is provided by mixing the sulphuric acid used with a sufficient quantity of water before allowing it to enter the apparatus. The steam given off from this vessel will thus be seen to consist, not only of all the steam which comes from the first vessel, but also of a large quantity formed by the chemical combination.

The whole of the steam passes on to the third vessel M, which works in exactly the same way as the first vessel or still C, except that it is under the influence of a higher vacuum, in order to obtain the necessary suction to cause the steam to pass through the layers of ammonia

liquid under treatment. The steam from this third vessel M then passes on to the fourth vessel N, which works just in the same way as the second vessel J, except that it also is under a higher vacuum than the second one. From the fourth vessel the steam produced is drawn over to the vacuum pump O, where a large proportion of the condensation may be effected by means of the cooled liquor drawn away through the pipe P from the bottoms of the vessels C and M.

**Lighthouse Illumination.**—Wigham, J. R., of Dublin. No. 7541; April 24, 1900.

This invention consists in a method of arranging incandescent burners in a group of sufficient diameter to transmit through annular lenses or other lighthouse lenticular apparatus a light homogeneous in character and specially suitable for the continuous pulsating light described in patent No. 19,812 of 1894. This is accomplished by placing in the focus of the lenticular apparatus a single incandescent burner (of any type), and surrounding it by a ring, or number of rings, containing similar incandescent burners placed close together—the rings being separated from each other by continuous annular air-spaces. The burners are fed with gas delivered at the ordinary burning pressure, or at such higher pressure as may be necessary to intensify the light, and caused by the gas-engine by which the lenticular apparatus of the lighthouse is rotated.

**Manufacture of Coal Gas.**—Lewes, V. B., of Greenwich. No. 7863: April 27, 1900.

This invention—relating to improvements in the manufacture of coal gas; its object being to prevent decomposition of the hydrocarbon gases which takes place in the retort, and consequently to obtain an increased volume of illuminating gas of high candle power—is fully described in "Technical Record" to-day, p. 820.

**Destructive Treatment of Refuse Carbonaceous Materials.**—Duff, E. J., of Liverpool. No. 10,267; June 5, 1900.

The patentee's object is said to be "to diminish the cost of refuse-destroying processes and apparatus, by obtaining utilizable bye-products. He proposes, therefore, instead of subjecting the refuse or waste carbonaceous materials to ordinary furnacing action, to treat it in a gas-producer, so as to obtain a combustible or partially combustible gas or mixture of gases, which will in many cases contain ammonia, to be separated by means of gas scrubbing or equivalent apparatus containing a weak solution of sulphuric acid.

The combustible or partially combustible gas or mixture of gases, after separation of ammonia, and after being cooled if necessary or desirable, may be advantageously utilized, says the patentee, in gas-engines, "or otherwise as a source of heat."

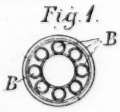
Where the recovery of the ammonia is not desired, and where the gas is required for driving engines, he scrubs, cleans, and cools the gas with water, or by other suitable means, previous to its utilization in the engine; and in cases where the refuse does not contain enough carbonaceous material to make a sufficiently good gas, he would add a little coal, coke, breeze, oil, or other enriching material.

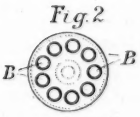
**Atmospheric Gas-Burners.**—Lacroix, P., of Paris. No. 21,997; Dec. 4, 1900.

This invention relates to burners "characterized by a draught of air produced at the centre of a non-luminous flame, and by the facility with which the mixing chimney may be dismounted, principally in proximity to the outlet-orifice for the mixture of air and gas, which is of great importance owing to the dirt which frequently collects at this point."

Fig. 1.

Fig. 2.



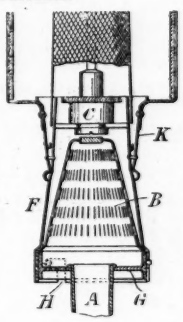

Upon leaving the chimney A (fig. 1), the mixture of air and gas engages in a burner-top comprising a series of tubular passages B, arranged circumferentially and sufficiently far apart to permit the external air to circulate between them. These passages terminate in an annular chamber C, forming the upper portion of the burner, through the middle of which is produced (at the centre of the flame itself) a draught of air which "greatly increases its calorific power." This device, applied to incandescent burners, is said to produce "a tubular flame of the most suitable form, since it becomes identified with the mantle without losing the benefit of a considerable internal and external contact with the air—an excellent condition for obtaining perfect combustion and the maximum result."

The chamber above referred to comprises two concentric walls D and E, between the upper portion of which is left an annular space, through which the mixture escapes in condition for ignition. The outer wall is surmounted by a moveable cap resting in a groove. The facility with which the burner and cap may be removed is particularly convenient for cleaning the two lips of the annular orifice, where dirt readily collects owing to the narrowness of the orifice.

Fig. 2 shows a modification of the device—differing from fig. 1 owing to the fact that the outer wall E, instead of entering a groove, fits upon the open-work crown, which is rigid with the inner wall D.

**Incandescence Gas-Burner.**—Sheldrake, J. H., of York Street, Westminster. No. 1058; Jan. 16, 1901.

This invention is designed to permit ready access to the interior of an incandescence gas-burner, so as to clean it without disturbing the mantle, and to shield the lower part of the mantle against local currents.




A is the tube by which the mixture of gas and air is supplied to the distributer B, above which is the central button C carrying the support for the mantle. Instead of making the button in one piece with, or rigidly attached to, the distributer (as usual), it is carried on the outer tube F, which rests on the base G that carries the distributer, and secured in position by a bayonet-catch H. To the upper part of the tube F is attached a short taper-tube K, which forms an external shield surrounding the lower lip of the mantle, and has attached to it arms to carry the glass. By raising the tube F off the base G, and along with it the button C, mantle, and glass, access is at once given to the distributer B, which can be cleaned, and then the parts be replaced, without disturbing the mantle.

## APPLICATIONS FOR LETTERS PATENT.

4963.—Lane, J., "Shade for incandescent gas-lights." March 8.
4964.—Carpenter, C., and Biggart, A. S., "Charging and discharging gas-retorts." March 8.
4982.—Hoffmann, F., "Production of compressed gas for lighting or heating purposes." March 8.
4993.—Cowan, T. W., "Gas chandeliers or pendants." March 8.
4997.—Windham, F., and Squier, C. E., "Acetylene gas apparatus." March 9.
4999.—Crosier, C., and Robertson, D., "Incandescent gas-burner." March 9.
5022.—Blakey, J. W., "Anti-vibrating gas and air burner for incandescent lighting." March 9.
5094.—Trewby, G. C., and Biggart, A. S., "Clearing ascension-pipes." March 11.
5096.—Beck, W. J., "Gas and other stoves." March 11.
5105.—Müller, H., "Improvements in the process of distillation." March 11.
5133.—Thompson, W. P., "Lighting and heating, and apparatus relating thereto." March 11.
5149.—Dannert, F., "Enriching lighting and heating gases with oxygen." March 11.
5155.—Foidart, M., "Explosion engines." March 11.
5160.—Tatham, E., "Measuring gas, water, or other fluids." March 11.
5189.—Crossley, W. J., and Atkinson, J., "Internal Combustion motors." March 12.
5198.—Maddox, T. W., "Globe holders for gas and other lamps." March 12.
5211.—Gabbett-Fairfax, H. W., and Brown, C., "Exhaust silencers for explosion engines." March 12.
5226.—Rostin, H., and Szubert, S., "Gas-burners." March 12.
5232.—Heinemann, W., "Recovering the bye-products from coke-kiln gases." March 12.
5241.—Thorn and Hoddle Acetylene Company, Ltd., and Thorn, F. S., "Acetylene gas apparatus." March 12.
5258.—Sugg, W. T., "Incandescent gas lighting appliances." March 12.
5293.—Macnab, J. O., "Lighting gas-lamps." March 13.
5330.—Delin, G., "Treatment of gas for illuminating and heating purposes." March 13.
5352.—Schultze, K., "Incandescent bodies for gas and other lighting." March 13.
5397.—Crossley, W. J., and Coster, A. V., "Internal combustion motors." March 14.
5398.—Crossley, W. J., and Atkinson, J., "Internal combustion motors." March 14.
5476.—Dutton, E. K., "Gas and other motors." March 15.
5514.—Jackson, J., "Cleansing ascension-pipes, hydraulic mains, and condensers." March 15.
5524.—Baltzinger, F., "Explosion motors." March 15.
5546.—Richmond, E. W. T., "Gas-heated stoves or apparatus." March 16.
5548.—Wright, J. W. B., and Darwin, H., "Gas-stoves." March 16.
5551.—Eales, S. W., "Chimneys for gas or other burners." March 16.
5553.—Smith, B. G., "Operating purifier-lids and the like." March 16.
5571.—Rowley, C. M., "Illuminant surfaces for incandescent gas lighting." March 16.

The shareholders of the Uckfield (Sussex) Water Company, at their half-yearly meeting last Tuesday, authorized the Directors to obtain parliamentary powers to raise £5000 of additional capital.

# CORRESPONDENCE.

*[We are not responsible for opinions expressed by correspondents.]*

## The Enrichment of Coal Gas by Benzol.

SIR,—If it is not too late, may I be allowed to notice the report of the last meeting of the Manchester District Institution of Gas Engineers, which I have only recently seen.

Mr. Ritson, one of the speakers, gave me the credit of having made some benzol enrichment tests with Manchester gas. This was a mistake on his part. It was Mr. Wilfred Irwin who did the experimental work referred to by Mr. Ritson. My enrichment tests were made at Rochdale, and were chiefly intended to compare the relative values of benzol and carburine. The results obtained were as follows:—

| | Gas Enriched One Candle by One Gallon of the Liquid. |
|---|---|
| Benzol 90's, 0·880 sp. gr. . . . . | 12,500 cubic feet. |
| Carburine, 0·680 sp. gr. . . . . | 5,700 ,, |
| Petroleum spirit, 0·700 sp. gr. . . . . | 4,300 ,, |

As the specific gravity shows, 1 gallon of benzol contains 2 lbs. more matter than carburine. Besides that, the molecular structure of the benzene molecule, $C_6H_6$, is such that, of all the liquid hydrocarbons known, it is the one best adapted for breaking up into the rich illuminant acetylene, $C_2H_2$.

In reply to some of the questions put by Mr. Hooton, I may say that commercial benzol is much more likely, in very cold weather, to deposit its heavier portions in the syphons and mains than is carburine. This, however, is of small importance in comparison with the far-greater enrichment power possessed by benzol. In the depth of winter some benzol, or the toluol portion of it, has been found in syphon-boxes which were within half-a-mile of the works, although the ordinary gas was being enriched less than 2 candles. Such condensation, however, did not occur when the enrichment was produced by means of carburine.

Numerous tests have shown that there is little or no increase in the total amount of sulphur in the purified gas through the use of the benzol necessary to give an enrichment of not more than 2 candles.

As regards regulating the candle power, this can be done satisfactorily by using the benzol-fed carburettor in the way described by Mr. Chew. It is, however, only fair to the more distant gas consumers of a town, when the outgoing gas is being enriched for the night only, that the carburettor should be set to work at least two hours before dark; the amount of benzol leaving the apparatus being increased as the demand for gas increases with approaching darkness.

In my opinion, neither benzol nor carburine will give the same amount of candle improvement with all gases of the same illuminating power. Many of them must differ in their density and composition, and the final changes or reactions occurring at the burner will not be exactly alike, though the same proportion of the enriching vapour may have been added.

THOS. STENHOUSE.

*Rochdale, March 20, 1901.*

## Incandescent Gas-Burners in Public Lamps.

SIR,—In reply to Mr. Wood's letter in your last issue, I refer your readers to the number of the "JOURNAL" containing his Presidential Address, and also to the number containing my last letter, when, having compared the two, they can judge for themselves whether my references to his remarks are—like the mantles at Bradford when the gas is lowered—distorted.

The vast majority of your readers will agree that incandescent gas lighting should be maintained so as at all times to give its highest possible photometrical value, rather than that efficiency should be sacrificed to the small saving in gas to be effected by lamplighters lowering the cock so as to only render incandescent the remains of a once perfect mantle. Every incandescent burner is so scientifically adjusted as to give the exact quantity of gas to air to enable its mantle to produce the best results. A minimum pressure of 17-10ths at the back of the governor is required. Any reduction of this pressure by lamplighters partially closing down the cock, neutralizes all the effects of the brain work brought to bear in the design, construction, and adjustment of the burner itself.

Lamplighters carrying ladders in crowded streets at dusk, if not in actual darkness towards the end of the round, or on their return, cannot now be looked upon as desirable adjuncts to street lighting, especially when compared with the ease with which electric lamps are lighted. The opening of lanterns in all weathers to light the burners, and the jarring of the columns by such frequent mounting, must be detrimental to the mantles.

It is only fair to Mr. Wood to point out that he did state that his antiquated advocacy would probably cause a smile. Were it not for the damage to such a valuable weapon (which incandescent gas really is to gas companies), by such suggestions emanating from a Presidential Chair, I venture to think that the smile would possibly degenerate into a "broad grin."

G. F. L. FOULGER.

*The Gaslight and Coke Company,*
*146, Goswell Road, E.C., March 20, 1901.*

## Popularizing the Use of Gas.

SIR,—I have read with much interest the series of articles by Mr. Richmond, relating the result of his experience and observations during his recent visit to the United States. After seeing the indifference, not to say apathy, so often displayed by some engineers and managers in this country, it comes somewhat as a revelation to see the enterprise and energy of many American and Colonial managers, put forth to secure new custom and increased consumption by encouraging, and doing everything possible to promote, day consumption. Having been some years since engineer and manager of a large Colonial gas-works, I may speak with some degree of authority on the subject.

It is not enough to sell or hire-out cookers, gas-fires, &c., and then calmly sit down, thinking that there the business is ended. Mains and services of adequate size must be provided; and sufficient pressure must be maintained to ensure the most satisfactory results alike to the consumer and to the gas company. Take my own case. On going into possession of my present house (in which are over thirty gas-jets), I found a ¾-inch service-pipe. As I contemplated fitting up six gas-fires and a cooker, I applied to the local gas company to put in a larger service. This was declined, unless I paid the cost of the new service. To this I pointed out the advantage that would accrue from the increased consumption, and merely got a reply that it was the custom and could not be deviated from. Again I urged my request; and eventually it was granted, practically as a favour.

Now mark the result. These gas-fires were in use the whole of one winter and half of the next. It was not an unusual sight to see my family sitting as close as possible round the fire, in a vain endeavour to get warm; but owing to the inadequate pressure, this was impossible. I therefore, in disgust, pulled out the gas-fires, and reverted to coal-fires, with all their attendant extra labour, dirt, and dust.

In the Colonial Company above referred to with whom I was formerly associated, we endeavoured in every possible way to promote day consumption, by close and prompt attention to the wishes of consumers, and meeting them in every reasonable way. We popularized the use of gas for cooking and heating, with the result that over 40 per cent. of the total gas consumed was between 6 a.m. and 6 p.m. We employed a staff of stove-inspectors, whose special duty it was to make a regular monthly call (by a house-to-house inspection), to receive and attend to trifling complaints, give useful hints to consumers, note pressures, canvas for new custom, &c. In addition, we gave weekly free lessons and lectures on cookery; and their popularity was evidenced by the large attendance of well-to-do ladies and others in lower spheres of life. So popular and general became the use of gas for cooking, that it was the regular custom in erecting even the smallest cottage to make provision for a gas-cooker, by building a recess with a flue, next to the kitchen range; and tenants declined to take houses unless this had been done. Our mid-day cooking pressures were equal to the heaviest lighting pressures, and in some cases even exceeded the night pressure—more especially on Sundays, when most families were assembled at home for the entire day.

Doubtless many engineers may raise the question of leakage and unaccounted-for gas, and expect this item to be very high. I can only reply that this was found not to be the case; and with large mains and services, it will be borne out, as in the experience of

COLONIAL.

*March 21, 1901.*

**Arsenic in Coke.**—A correspondent who has made a study of this question, in the course of a communication, says: "There are no doubt a few cokes with only trifling quantities of arsenic; but most cokes contain an appreciable quantity. This is condensed on the skin of the malt, and must be brushed off before the malt is used; otherwise the arsenic gets into the beer and yeast."

# PARLIAMENTARY INTELLIGENCE.

## GLEANINGS FROM THE COMMITTEE ROOMS.

**Opening of Committee Proceedings.**

The Committee work on Private Bills in the first Parliament of King Edward VII. commenced last week; and once more the well-known corridors presented the customary busy scene when Committees are sitting, and which scene has a fascination for those whose duties carry them there day by day in session after session. Self-impressions give rise to the idea that many who pass through the same halls and ascend the same steps anew after an absence of six months or so, cannot refrain from reflecting on some of the notable conflicts they have witnessed in former times in the rooms which they are approaching, and such a train of thought no doubt leads on to a little musing on the work of the opening session, and there pass before their mental vision the numerous promoters and opponents of measures who will, as others have done before them, traverse the same ways filled with confidence and hopes and fears, and return along them elated by victory or dejected by defeat. But revolving in mind the characters of the Gas and Water Bills which are expected to undergo investigation in the Committee rooms during the session, there do not appear to be many which give promise of remarkable struggle, or are likely to make themselves memorable by giving birth to new precedents. It is a barren session, however, that does not produce some little surprise in this way.

One Bill whose fate would have supplied opportunity for speculation had it gone forward was that of the Gaslight and Coke Company; but, alas, it has already gone the way of its immediate predecessors. It may be truly said of this one and them that "brief life was here their portion." Among engineers one of the questions of the day is, what are the Company going to do now? Nobody outside the Company exactly knows; and few will even hazard a suggestion. But rumour has it that already at Horseferry Road careful examination has been made to find the directions in which economy in expenditure may be effected. The next great Gas Bill is that of the South Metropolitan Company; but when one talks of the chances of the part of the measure referring to the transfer of the Nine Elms works getting through in the present state of public feeling, there is a shaking of doubtful heads. Anyway, everybody in the gas world knows the South Metropolitan Company have done their best to comply with this particular recommendation of the Powers of Charge Committee. The Mond Gas Bill is the one whose fortunes will be followed with most general interest; and many engaged in the management of the gas undertakings of the Midlands feel a personal concern in it. The Bill

has been referred to a Committee who commence their sittings on Tuesday; but from the appearance of the Bills which precede it on the list, there is not much chance of its being reached this week, and next week will be a short one for Committee work. A good deal of time is likely to be consumed by the Bill. It has attracted a legion of opponents; but a great number of them are local authorities who merely desire to obtain protective clauses. Gas companies and gas-works owning authorities in the area which comes within the scope of the measure have petitioned against it; so that altogether the fighting promises to be keen. Experts who have been retained have been busy during the past week or two preparing their proofs; and some interesting evidence may be anticipated. Among other Gas Bills, there are a few cases of proposed purchase. Poulton-le-Fylde and Heckmondwike have already been disposed of; and Hartlepool, which is the most important case, is, at the time of going to press, under consideration. We hope that the overthrow of the proposal of Heckmondwike and Liversedge to purchase the gas-works may be taken as an augury of the course of action in attempts at municipalization during the session. There are further instances this year of powers being sought for the conversion and consolidation of stock, which shows that this method of simplifying capital accounts is gaining extended favour. But on the surface, in the category of Gas Bills for general powers, nothing of moment is presented. Of the Water Bills which will come before the Committees, much the same might be written. The London County Council already know the fate of their Purchase Bill; and there are not any entirely new schemes of magnitude which will claim attention. Still there are measures which will not proceed on their way without encountering some stiff fighting.

**Settlements and Experts.**

A goodly number of the Bills in which readers are interested stand in the records as opposed measures; but we have good authority for believing that, as the session passes on, it will be found that many of the parties have, before incurring heavy expense in parliamentary proceedings, adjusted their differences, and will not require the judgment of a Committee of one or both Houses upon them. At the close of this session, some of our consulting gas engineers may even find that they have established records in the number of disputes they have settled "out of Court." We sincerely hope this may prove to be so; for the heavy expense which has on many occasions been incurred by promoters and opponents in fighting over the most trivial points has been, to put it in one plain word, "scandalous." But there are signs and there is authority for saying that negotiations are going forward which it is hoped will shorten the list of opposed gas measures this session. Gentlemen of the long robe may not approve of seeing a diminution instead of a growth in one of their most lucrative sources of income. The gas industry has no care in that direction; but the more settlements there are, the more will those who have the management of the several units of the industry be convinced that there are men among those who have established reputations as consulting engineers who will, if they can do so without impairing the interests of their clients, save them the trouble, expense, and anxiety attaching to an appearance in the Parliamentary Committee rooms. But, of course, however diplomatic a consulting engineer may be, he cannot always be expected to bring about agreement. One or other of the parties may be irrational in their demands or in the nature of their concessions, and will not listen to counsel or reason; and as the records of our parliamentary proceedings show, the views of consulting engineers themselves are not infrequently a very "long chalk" off being in harmony. Differences, too, on the parts of promoters and opponents are often carried right up to the doors of the Committee rooms; and then negotiations in the lobby result in agreements which could just as well have been come to locally, without tearing a number of men away from their businesses, and causing an unnecessary expenditure of money. But some people seem to delight in a stubborn resistance to the last minute, and then give way after arriving at Westminster. Whether it is that a feeling of awe overcomes them as they approach the portals of Parliament, or whether they have held aloof from personal intercourse with their opponents until they have been brought face to face in the narrow corridors of the Committee rooms, or whether some other influence operates (it surely cannot be repentance or remorse!), we do not know; but there is the fact that instances multiply of such agreements, which nothing apparent could have prevented at an earlier stage. In writing thus, it has, of course, not been overlooked that there are Bills the very nature of which would defy settlement save at the hands of Parliament.

**Poulton-le-Fylde Gas Transfer Agreement.**

The Lords preceded the Commons by two days with their Committee work; and Lord Newton's Committee were the first tenants of one of the rooms. They commenced work on Tuesday morning; but the group of measures which had been referred to them was quickly curtailed. The second on the list was the Poulton-le-Fylde Gas Bill; but before many hours were over it was struck out of the list by the withdrawal of the opposition. It was an application for purchase powers by the District Council; and, under the peculiar circumstances existing in the case, the road to settlement was an easy one for the parties. But arrangements for the withdrawal of the petition were not made until members of the Council and the Company met in the lobby. The agreement was wise, as, even had the parties persisted in contesting the matter, there can be no question that the ending would have been the same, as will be seen by a short relation of the conditions affecting the case. In 1888, the Company obtained a Provisional Order, incorporating a limited Company. In that Order a purchase clause was inserted by consent of the Company; one of the conditions being that the Company should remain in possession for seven years, at the end of which period (and within fourteen years) the Local Authority might purchase. The terms of transfer were to be: (1) The capital expenditure of the Company to the date of transfer; and (2) such a sum to be added for goodwill as might be arrived at by agreement, or failing that by arbitration—the arbitration to take place under the Public Health Act of 1875. Now it seems that it was entirely on this last-named condition that the Company obtained a footing for opposition. The fourteen years will expire next year; and in the thirteenth year the Local Authority came with their Bill for purchase. A little more delay, and they would have set themselves outside the favourable provisions in the Order relating to transfer. But time has made a change which the Order did not contemplate—the original intention to purchase under the Public Health Act being frustrated by the fact that, in addition to the area of the District Council, outside districts are included in the Company's undertaking. Consequently, the Council proposed, in their Bill, to vary the conditions by supplanting the Public Health Act by the Lands Clauses Act. This resulted in a petition by the Gas Company, which set forth their feeling that they would suffer in the amount paid to the shareholders if this alteration were allowed to be made. The upshot of the matter was that an arrangement was come to in the lobby last week that the conditions set forth in the 1888 Order as to purchase should be observed, and that the sum of £250 should be paid in addition to meet expenses and compensation. The intention of 1888 was clear; and, as already remarked, in this particular case, there could have been no other ending than the one arrived at. Mr. W. A. M'Intosh Valon was advising the Council in the matter in Parliament; and Mr. Thomas Newbigging was the expert consulted by the Company.

**Heckmondwike Gas Transfer Rejected.**

The first Commons Committee to take up work was that over which Mr. C. E. Schwann is presiding; and they assembled for duty on Thursday morning. The Chairman is a practised hand in that capacity in Committee work, and Gas Bills have frequently been allotted to him; so that he brings knowledge of the subject to bear on the measures upon which he has to adjudicate, and that knowledge may have assisted him and his colleagues in arriving at the decision they did last Friday on the Heckmondwike Bill. This was the first in the Committee's group; and it proposed the constitution of a Joint Gas Board for Heckmondwike and Liversedge, and the transference to the Board of the local gas-works. The Company are supplying gas at the low price of 2s. 6d. per 1000 cubic feet; so that not much complaint can be made on that score. But the promoters showed their foolishness by making a point of it. They also sought to build up a case for transfer by impeaching the management of the Company on most trivial points, which more than one gas engineer who heard the evidence characterized as extremely "frivolous." Promoters of Transfer Bills do not appear to have taken to heart one of the lessons of the last few sessions—that it is no use attacking a stronghold with peashooters. The measure given to the case for the Bill by the Company's representatives is shown by the fact that Mr. Baggallay (leading Counsel for the Company) merely addressed the Committee, and did not trouble them with the evidence of the two engineering experts whom he had present—Mr. E. H. Stevenson and Mr. W. R. Chester. His view was justified; for, after deliberating for a few minutes, the Committee pronounced in favour of the Company. The engineering evidence for the promoters was furnished by Mr. Fletcher W. Stevenson and Mr. E. A. Harman.

**Hartlepools Gas Transfer Bill.**

The Heckmondwike Bill having received its *quietus*, Mr. Schwann's Committee proceeded on Friday afternoon to the consideration of a similar Bill, but of more import, promoted by the West Hartlepool and Hartlepool Corporations for the purchase of the undertaking of the local Gas and Water Company, which it is proposed to commit to the management of a Joint Committee. Needless to say, after the decision in the previous case, the promoters of this Bill did not approach the inquiry with an easy mind. The Company have been frequent visitors to Parliament of late years. They were there in 1898 and again in 1900 with Bills of their own; and on both occasions West Hartlepool tried to secure an advantage in the way of a purchase clause, but failed. Each time the Company showed that they had a particularly clean slate. Now the Authorities—still anxious to obtain possession of the concern—have come with a Bill for compulsory purchase; and for the third time in four years the Company have to defend their concern. It required nothing more than the opening of Mr. Pember to show that the promoters approached Parliament with a case that was entirely destitute of robust argument. Both in style and substance, the learned gentleman's speech was laboured for want of material. "I do not know," he said, "that there is any great fault to find with the Company;" but he did know that it would have been impolitic to have tried to introduce accusations after the honourable manner in which the Company have twice recently emerged from the parliamentary dissecting rooms. He based his whole argument for expropriation on "public policy." But it was public policy without a backbone; for how the public can be better served by the Municipalities than they have been by the Company we have yet to learn. However, perhaps the evidence of Mr. J. Mansergh on the water part of the Bill, and of Mr. W. A. M'Intosh Valon and Mr. Alfred Colson on the gas part will enlighten us. At the rising of the Committee on Friday, only local evidence had been called.

Yesterday further local witnesses and Mr. Mansergh claimed the whole of the sitting; and the water portion of the Bill almost monopolized attention. But really, so far, nothing specific has been brought forward which requires an answer from the Company. However, if needed, they are prepared with an array of witnesses of a calibre the like of which is rarely seen associated in one case. For the gas part of the measure, there are Mr. George Livesey, Mr. Corbet Woodall, Mr. Thomas Newbigging, Mr. E. H. Stevenson, and Mr. C. Hawksley; and for the water section Mr. T. Fenwick, Mr. E. K. Burstal, Mr. E. M. Eaton, Mr. W. B. Bryan, Mr. C. Hawksley, Professor Dewar, and Mr. John Pattinson. But all these witnesses are not, in view of the present aspect of the promoters' case, likely to be required. In putting the water portion of the Bill forward with such prominence at the outset, the promoters have been well advised; for if the Bill passes, it will undoubtedly be this part which will carry the other. By the way, Dr. Macnamara, one of the members of the Committee, is credited with having a decided twist in favour of water supplies being under the control of local authorities.

**Sheffield Gas Company and Electrolysis.**

A decision on the question of electrolysis was obtained by the Sheffield United Gaslight Company when the Corporation Omnibus Bill (which sought further powers in connection with the electric tramways) was before Lord Newton's Committee last week; and their gain will be useful to gas and water companies in the future, as it confirms the protective clause which was inserted in the London County Tramways Act of last year, being framed in somewhat similar terms. It puts on the shoulders of the Corporation liability

to make compensation for any injury or damage to the system of the Company resulting from fusion or electrolytic action caused by currents generated or used for the purpose of electric traction on the Corporation tramways. The clause is a distinct advantage to the Company; and for it they and gas and water companies generally are indebted to the persistent effort of the South Metropolitan Gas Company aided by the Lambeth Water Company last session. But, at the same time, it cannot be regarded as anything more than a stepping-stone to even more rigid safeguards. To obtain these a united movement must be made; and Mr. George Livesey has only recently pointed out in our "Correspondence" columns how assistance may be rendered. It must be remembered that it is not only the gas and water distribution systems that are imperilled by electric tramways, but public safety (especially in the case of gas-mains) is seriously menaced.

**Salford's Difference with Manchester.** Unfortunately, those two great neighbours the Manchester and Salford Corporations could not arrive at an understanding at home on the question which had arisen between them in regard to the price paid for water supplied in bulk by the former to the latter, and so they both put in a strong appearance at Westminster last week to argue the matter before Lord Newton's Committee. The facts are simply these: Before 1846, Manchester and Salford were both supplied by a Company, which in 1847 was purchased by the Manchester Corporation, who agreed, in order to get rid of Salford's opposition to their Bill, to concede to the town the right to supply the inhabitants—the water to be furnished by Manchester at a price to be fixed by arbitration. But afterwards it was agreed that Salford should receive 2 million gallons per day in bulk, at the price of 3d. per 1000 gallons. The requirements of Salford now exceed the limitation, and for all water taken in excess the Manchester Corporation charge their neighbour 8d. per 1000 gallons. This Salford consider hardly fair; and in August last they wrote to the City Corporation complaining first of the pressure of the water, and then asking if the Corporation were prepared to enter into a statutory obligation to supply in bulk such quantity of water daily, in addition to the 2 million gallons, as they might require for all purposes, the price to be fixed by an arbitrator. But correspondence did not bring the parties into accord; and so Salford proceeded with a Bill for the purpose of enforcing what they regarded as a just claim. The attitude of Manchester appears to have been one of unreasonable obstinacy; for what they were unwilling to entertain before the matter was submitted to Lord Newton and his colleagues, they yielded to at the opening of the second day's proceedings on the Bill, by offering to leave the whole question to the arbitrament of an independent authority, including the price paid for the 2 million gallons. The noble Chairman, upon this, expressed the opinion that there was not much between the parties, and that it ought to be possible to arrive at a settlement. On Friday morning a clause was brought up and agreed to, providing for the submission of the question of price to an arbitrator, and instructing him to take into consideration the amount paid for the 2 million gallons, the circumstances under which the statutory provisions in relation thereto were passed, and all other matters in connection with the water undertakings of Manchester and Salford respectively. Further it arranges for the revisal of the terms by the arbitrator upon either Corporation giving three months' notice, but not oftener than once in five years. Embodying this agreement, the Bill proceeds.

**Prestatyn Water Transfer.** A little Bill promoted by the Prestatyn District Council was another measure which claimed the attention of Lord Newton's Committee, who, as foregoing paragraphs indicate, had an extremely busy week. Prestatyn is a growing place; and the Local Authority are seeking to develop it, in the hope that in the not distant future it will rival some of the present popular Welsh holiday resorts. An effective water supply is an essential to this end. Therefore, presumably regarding the present supply as defective, they asked Parliament to grant them compulsory powers of purchase, and the means for making a further provision of water. The "Company" is a "one-lady" concern—Mrs. M'Laren being the sole proprietor. After some three hours' hearing by the Committee, an agreement was arrived at with this lady for the transfer of the undertaking for the sum of £7750, with the right to take 120,000 gallons of water per day from the Ffynon Asaph spring, of which she is also the owner. The capital of the concern amounts to £5000. This settlement only left the question of compensation water to be agreed upon between the Council and the riparian owners on the Marian stream; and a clause was accepted by their Lordships at Friday's sitting.

## HOUSE OF LORDS.

The following further progress has been made with Bills:—

Bills reported, with amendments: Arlesey Gas Bill, and Newcastle-upon-Tyne and Gateshead Gas Bill.

The Select Committee on the group of Bills containing the Poulton-le-Fylde Gas Bill, whose sittings commenced last Tuesday, reported to the House on that day that, as no parties had appeared in opposition to the measure, they had not proceeded with its consideration.

## HOUSE OF COMMONS.

The following further progress has been made with Bills:—

Bills read a second time and committed: Dorking Gas Bill, Golborne Gas Bill, Llandrindod Wells Water Bill, Long Eaton Gas Bill, Richmond Gas Bill, Stroud Gas Bill.

Bill reported [preamble not proved]: Heckmondwike Gas Bill.

The Colwyn Bay and Colwyn Urban District Gas Bill, Crawley Gas Bill, Gravesend Gas Bill, Horley District Gas Bill, Petersfield and Selsey Gas Bill, and Richmond Gas Bill have been referred to a Select Committee, consisting of Mr. Harwood (Chairman), Mr. Royds, the Master of Elibank, and Mr. Allhusen; to meet on Tuesday, March 26.

The Derwent Valley Water Board Bill, Ilkeston and Heanor Water Board Bill, Kettering Urban District Water Bill, Long Eaton Gas Bill, Mond Gas Bill, and Stroud Gas Bill have been referred to a Select Committee, consisting of Colonel Welby (Chairman), Mr. Cawley, Mr. Cubitt, and Mr. Soares; to meet on Tuesday, March 26.

## REFEREES' COURT.—Tuesday, March 19.

To-day the Court, under the presidency of the Right Hon. J. W. Lowther (Chairman of Ways and Means), considered the *locus standi* of the Sunderland and South Shields Water Company, who desired to petition against the

HARTLEPOOLS GAS AND WATER (TRANSFER) BILL.

Mr. Honoratus Lloyd, for the petitioners, said the Hartlepools Corporations sought power to compulsorily transfer to themselves the undertakings of the existing Gas and Water Company, and under clause 46 of the Bill, to enter into agreements with companies or persons for the supply of water in bulk beyond their limits, provided that it should not be given except with the consent of the local authority or of the body or persons already supplying water under parliamentary powers to the district. Thus the promoters would be authorized to supply water in bulk in the district of the Sunderland Company under an alternative consent. Of course, it would not suit the promoters to take the first alternative, and obtain the consent of the Local Authority, and thus compete with the Sunderland Company and without the latter's permission. The model clause set forth that the consent of the local authority "and" of the persons supplying should be obtained; but the promoters had altered it by substituting the word "or." Then, in clause 85, they said that when new streets were being laid out, and had not been taken over by the local authority, the houses in those streets might, with the consent of the owners, be supplied by them with water. It was clear that the promoters would be able to compete with his Company; and, there being danger of competition, he submitted that he should be allowed *locus*.

Some discussion having taken place,

Mr. Lloyd said the promoters had agreed to the word "and" being inserted in place of "or" in clause 46, which would give him his *locus*, as it was proposed to make an alteration in the Bill, and he was entitled to go before the Committee to see that everything was settled satisfactorily.

The Chairman: Not at all. You cannot have it both ways.

With regard to clause 85, it was pointed out that it was governed by clause 5, which dealt with the limits of supply. Also that the petitioners could not be in any way affected, as the promoters were confined to their limits, except where the contrary was expressly stated, as in clause 46.

The Chairman: The *locus* is disallowed. Mr. Bonham-Carter has been appointed on the Committee on this Bill, and he will see that the model clause is inserted.

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The Court also had before them an application by the Cleckheaton Urban District Council for *locus standi* to appear in opposition to the

HECKMONDWIKE GAS (TRANSFER) BILL.

The Hon. J. D. FitzGerald, K.C., for the petitioners, based his claim on Standing Orders 134 and 134A (relating to the powers of the Referees), and on the ground of competition and invasion of the district which the District Council now supplied with gas under statutory authority. The Heckmondwike Gas Company and the Cleckheaton District Council had power to supply gas in a part of the area of Liversedge; but both had recognized that each was confined to its own portion of the area—the Act of 1862, which enabled the Company to supply in Liversedge, being regarded as a dead letter. Under the Bill, it was proposed to constitute a Joint Board, consisting of representatives of the townships of Heckmondwike and Liversedge, and to transfer thereto the undertaking of the Company; the limits in which the Board could supply being expressly stated to be, among others, the districts of Heckmondwike and Liversedge. If the Bill were passed, it would entirely alter the present position, to the necessary prejudice of the Council; for there would not then be, as now, a Company with overlapping powers which had never been exercised, because they could not be exercised profitably, but a Board with the rates of the locality behind it, one of the constituents of which was the Local Authority of Liversedge, whose district the Cleckheaton Council were now supplying. Clearly, a first result would be that the public lighting of Liversedge would be transferred from the Council to the Board; and every consumer in Liversedge would have the strongest pressure put upon him to give his custom to his own representative Board. In these circumstances, the Cleckheaton Council would suffer considerably, because no doubt they would eventually lose the supply within the portion of Liversedge in question.

Mr. Balfour Browne, K.C., for the promoters, in opposing the application, pointed out that at the present moment the Gas Company had power to supply the whole of Liversedge, and all that was proposed was to put the Local Authorities of Heckmondwike and Liversedge in their place. There was no proposal to extend the boundaries; and if there was to be competition, it could exist to-day. Standing Order 134 had nothing to do with the case, because the promoters were not affecting the district of the petitioners.

The Chairman: You need not go further; *locus standi* will not be allowed.

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LONG EATON GAS BILL.

This Bill, which is for the dissolution and re-incorporation of the Long Eaton Gas Company, was also before the Referees, on the petition of the Draycott Gas Company to be heard in opposition to it.

Mr. Moon, K.C., appeared for the promoters; Mr. Pembroke Stephens, K.C., represented the Company.

Mr. Pembroke Stephens, in applying for *locus standi*, said the Bill sought powers largely in excess of those obtained by the promoters in their Act of 1880. They had done nothing for twenty years, and now they were craving for further powers, and saying to the Draycott Company, who had obtained their Act and been working in the meantime, that they were not to be heard.

Mr. Moon said the Bill was only one for re-arranging the affairs of the Company, and did not contain any new powers.

Mr. Parker Smith, M.P. (who presided in the temporary absence of

Mr. Lowther): The mere alteration of capital has been held by this Court not to be a ground for granting *locus standi*. It is not a fresh competition at all. It is, if anything, an improvement of existing competition. The Court do not attach any importance to the incidental new powers in the Bill.

Mr. GREEN, M.P.: Here we have the promoters lying by for twenty years, and doing nothing, while, on the other hand, there is a Company which has been in possession and working for fourteen years. It seems to me that it is a case for discretion on the part of the Court; and I think it is one in which those who have been in possession should be heard.

The room was then cleared. On the re-admission of the parties,

The CHAIRMAN said the Court would not allow the *locus*.

## HOUSE OF COMMONS COMMITTEE.

### Thursday, March 21.

(*Before Mr.* SCHWANN, *Lord* BALCARRES, *Mr.* L. HOGG, *Dr.* MACNAMARA, *and Mr.* BONHAM-CARTER, *Referee.*)

HECKMONDWIKE GAS (TRANSFER) BILL.

This Bill, the main object of which is to constitute and incorporate a Joint Board for the urban districts of Heckmondwike and Liversedge, in the West Riding of York, and to transfer to, and invest in, the Board the undertaking of the Heckmondwike Gas Company, came under the consideration of the above-named Committee to-day.

Mr. BALFOUR BROWNE, K.C., and Mr. LYMINGTON WILLIAMS appeared for the promoters; Mr. CLAUDE BAGGALLAY, K.C., and Mr. FRERE represented the Heckmondwike Gas Company, who opposed the Bill, as did also the London and North-Western Railway Company, but they were not represented by Counsel.

Mr. WILLIAMS, in the absence of Mr. Balfour Browne, proceeded to open the case for the promoters. He said the only petition which they need be troubled with was that of the Gas Company, whose undertaking it was sought to acquire. Heckmondwike and Liversedge were important Local Authorities in the Spen Valley, in the West Riding of York. The Spen Valley (and particularly these two districts) was the seat of the heavy woollen trade. There were also engineering works and other businesses; and altogether it was one of the busiest centres of the West Riding. Heckmondwike itself obtained local government as far back as 1853, but Liversedge had only become a Local Board in 1875; and both places from then to the present time had made very rapid progress. Speaking roughly, the rateable value of the united district was £80,000. Their boundaries were coterminous; they had an area of 2227 acres; and at the last census there was a population of 23,378, which, it was believed, would be found at the coming census to have increased to 27,000. The two places had excellent railway facilities; all the leading Railway Companies in the North of England having direct lines to, or running powers into, them. The primary duties under the Public Health Act had been fulfilled adequately. Both the authorities had shown that spirit of progressiveness which would appeal favourably to the Committee in the present application to acquire the gas undertaking. With all their liabilities and public duties, the rates in the district—including the poor rate and the county and other rates—amounted to 6s. 8d. in the pound; the poor rate being half this amount. The public debt of Heckmondwike, including the water undertaking, was £138,000; that of Liversedge being £23,418. The difference between the two was owing to the fact that Liversedge had a supply of water in perpetuity, through an agreement with the adjoining county borough of Bradford. It had not, therefore, been necessary for them to undertake water-works like Heckmondwike. The promoters asked that they might be authorized to acquire, either by agreement or compulsorily, the undertaking of the Heckmondwike Gas Company. They proposed that there should be a Joint Board formed, consisting of ten members—five to be appointed by each Council. The machinery for carrying the Joint Board into execution, and for the performance of the duties, was very complete, and had been agreed to between the parties. As to the existing Gas Company, their history was this: In 1884, they were a private Company, with not even limited liability. In 1850, the shareholders or partners executed a trust deed, when it was stated that the capital was £3500; and it was proposed to double this amount, in order to carry on the business. In 1862, they became a statutory Company. The whole capital of £7000 had been raised; but according to the recital in the Act of 1862, it was stated that they had spent out of undivided profits a further sum of £3500, and Parliament sanctioned this amount being added to the then existing capital. This £7000 was allowed to earn a maximum dividend of 10 per cent.; but the £3500 was only to bear a dividend of 4 per cent. The Act went on to authorize the raising of a further sum of £10,500, with borrowing powers to the extent of £3000. In 1875, the Company again came to Parliament, and applied for further powers, including the borrowing of money. The amount authorized was £42,000. Neither of the Acts contained any auction clause, nor sliding-scale for the payment of dividends based on the actual amount charged for the supply of gas; and this, he maintained, had caused considerable remissness—if not something worse—in the management of the undertaking.

Mr. FRERE pointed out that the provisions referred to were unknown in 1875.

Mr. WILLIAMS said the fact was that the Company were working under an Act which gave no incentive to economy, and by which the consumer could not get any advantage. The spirit of the Act of 1875 was that they should raise the capital by equal instalments of £10,500; and that they should also exercise their borrowing powers, not merely for the sake of carrying on the concern economically, but for the benefit of the consumer himself. What they did was—he did not say it was illegal, but it was straining the four corners of the Act—to issue the £42,000 of extra capital at once, calling up only a small portion of the amount they had power to raise. According to the last printed accounts, their present debt was only £3400. The amount they had borrowed as a preferential charge at a low rate of interest in respect of this £42,000, had been the sum of £400 only. Considering that they borrowed this at 3 and 3½ per cent., and that they were entitled by their Act to pay a maximum dividend on the £42,000 of 7 per cent., it was obvious that, if they had exercised their borrowing powers as the Act intended that they should, there would have been less revenue to distribute among the shareholders, and in consequence there might have been a corresponding reduction in the price of gas to the consumer. The policy of Parliament under the Gas-Works Clauses Act was this: "You may earn a profit—you may if possible earn a reasonable profit. The maximum is fixed by law But when you have earned your profit, and set aside the necessary amount for your reserve fund, then you must, if you have any surplus income, reduce the price of gas so that the consumers can get it at the smallest reasonable sum." He submitted that, in the present case, the Company had violated this cardinal principle by issuing the whole of their new capital at once; calling up only as much as might be necessary. There was every reason to believe that the Company intended to spend a considerable sum of money in extending and enlarging their works, for during last winter every retort was working at its full power. Had a breakdown occurred, probably Heckmondwike and Liversedge would have gone short of gas. Of course, the Company were now in a hurry to remedy the defects of their works. But while they were doing this, they might have to come for another £21,000; and the promoters of the Bill, therefore, said this was the time when the transfer should take place to a public body who would administer the undertaking to the advantage of everybody concerned. The Company had for years past written down their capital by £700; and for the six years ending in 1898, the total sum shown in the depreciation account amounted to £4781. The Company had been spending money that should have come out of capital. The capital authorized was £42,000; but the Company had spent on the works £42,628. Carrying forward their excess balances for years past, they had been paying the maximum dividend on the capital they were entitled to raise. As showing the way the Company had managed their affairs, Counsel pointed out that in 1893 the leakage of gas amounted to 23 per cent. The Local Authority had drawn attention to this, but had been told that the Company were under no obligation to give them any information. But the inquiry of the Local Authority had, at any rate, had one good result, because the Company had done their best to reduce the leakage. At present the leakage was something over 11 per cent.; and there was still a good deal of room for improvement. The Company's purifying apparatus was now over an old gasholder tank containing tar and other residuals; and if an explosion occurred, the purifier would be useless. Besides this, there were serious defects in the public lighting; and he maintained that, wherever there were causes of complaint of this kind, the policy of Parliament was to allow the Local Authority to acquire the undertaking. It must not be forgotten that the promoters were purchasing under the Lands Clauses Act. In their petition, the Gas Company contended that no advantage would accrue to the owners of property, ratepayers, or consumers of gas in the districts by the proposed transfer; a large proportion of the inhabitants and ratepayers were against it. Furthermore they said that the price charged for the supply of gas, both to private consumers and for public purposes—viz., 2s. 6d. net per 1000 cubic feet—was lower than any gas undertaking within a radius of five miles. This was misleading, for at Cleckheaton the charge was less. The works in that case were in the hands of the Local Authority. At Batley, too, the charge was only 2s. 3d. per 1000 cubic feet. The difference between the parties was only one of price; for one of the principal witnesses of the promoters had been approached, and had been asked by the Company if the District Councils would be prepared to pay a certain figure. But they had declined the proposed terms.

Mr. *Thomas Redfearn*, Chairman of the Finance Committee of the Heckmondwike Urban District Council, and a member of the Joint Committee appointed to promote the Bill, gave evidence in support of the opening statement of Counsel. He held that if the proposed transfer were allowed, it would tend greatly to the advantage of the ratepayers and the gas consumers of the district.

Mr. BAGGALLAY (in cross-examination): You have not always been friendly to the Company.

*Witness:* No.

Did you not, in consequence of your hostility, find yourself at Leeds Assizes?—Yes.

What did you do then?—I did nothing.

Did you not apologize?—No; I did not. I was advised to do so. Two guineas were paid, and £50 costs. But the Company's costs amounted to £90.

You slandered the Company?—That was the charge; but the result of the case has been that the leakage has been reduced. The action was tried in 1893.

Who paid the costs?—That is immaterial; they were paid.

Who paid them?—My Solicitor. He is Clerk to the District Council.

It did not cost you anything?—Yes, it did. It cost me £50.

Witness, in further cross-examination, said that in 1892 the Company carried forward a balance of £1800. No doubt the remedy of the Local Authority was to go to the Quarter Sessions; but they preferred to go direct to the Company. Since then the price had come down from 2s. 10d. to 2s. 6d. per 1000 cubic feet. Batley, where the price was 2s. 3d. per 1000 cubic feet, had a population of 30,000. If Heckmondwike made no profit at all by the transfer, it would still be an advantage to have the works. In 1896, his view was that the Company were working their undertaking as economically as any in the district, and that they had remedied the excessive leakage. Between 1893 and 1896 the Company had a new Manager, who made great improvements. As to the leakage, he agreed to the general proposition that in districts like Heckmondwike, which were undermined, it was larger than in places which were not. One advantage of the transfer, if it had taken place last year, would have been that the Council would have had a profit of between £700 and £800 above the amount of the statutory dividends; and this sum would have been carried to the relief of the rates or to the sinking fund. His Council had electric lighting powers. The generating station was ready for the roof; but the cables had not yet been laid. He inferred that the Company were willing to

sell their concern, because in an interview with Mr. Stead, the Chairman, he gave witness a figure which the Directors would accept.

Mr. *S. Wood*, Chairman of the Heckmondwike District Council, said most emphatically the feeling of the district was favourable to purchase. Under the control of the Local Authority, there would be greater efficiency in management and better results.

Cross-examined by Mr. FRERE: He complained very much of the quality of the gas; but the Council had never exercised their right, under the Act of 1871, to appoint an inspector to test it. He did not know that the illuminating power at which the Company were bound to supply was 14 candles, but that as a fact the gas was of 17-candle power. He thought the Joint Board would work well, though he admitted that formerly there had been some friction on the Joint Water Board.

By the COMMITTEE: He was not aware that the Council had sent a written complaint to the Company as to the quality of the gas. There had been universal dissatisfaction. It might be a duty of the Local Authority to make such a complaint; but when a statement was put forward publicly, and reported, it was considered that the Directors knew of it.

Mr. *Albert Mitchell*, a member of a firm of worsted spinners of Liversedge, and Chairman of the Finance Committee of the Liversedge District Council, said he had written several times to the Company about the bad quality of the gas they supplied. In the winter of 1899, the Liversedge Council received a letter from the Company asking them to curtail the lighting of street-lamps as much as possible, because they were afraid they would be unable to keep up the supply of gas. The works, he thought, were insufficient for the supply of the district. Having regard to the management of the Company, he was of opinion that the Local Authority should have control of the works.

Cross-examined: The Company asked them to curtail the use of gas in the middle of the period of the increased price of coal. He did not think companies generally, at the time, had to effect economy in the supply of gas.

Mr. *E. A. Harman*, of Huddersfield, said he made an inspection of the works. In December, 1899, the output of gas was 740,000 cubic feet in the 24 hours; and every retort was used in maintaining the supply. Immediate extensions were necessary, if the Company were to go on supplying; and from advertisements in the local papers, he gathered that they were carrying out fresh works. These extensions would be made, if undertaken by the Company, out of capital raised in the ordinary way; and as the Company were not under the operation of the auction clauses, they would be able to distribute 7 per cent. on this capital. The works immediately required would cost at least £10,000, which the Local Authority could raise at 3½ per cent. The extensions would therefore cost the consumers double as much if carried out by the Company as they would if undertaken by the Local Authority. The works, which were in a fairly satisfactory state, required re-modelling. In his opinion, the purifiers should be removed from their present highly dangerous position over the tar and liquor storage tanks. The works were in four parts, with roads running between; and this made the site disadvantageous for extensions. He held that the purchase would be beneficial in every way to the consumers. The Company had been paying statutory dividends for a long time; and therefore they had no incentive to enterprise, such as the introduction of slot meters and cooking-stoves. Considerable sums of money had been spent on capital account out of revenue; and the Company had also been in the habit of depreciating their plant, which was contrary to the law.

Cross-examined by Mr. BAGGALLAY: He did not know it was common for purifiers to be situated over tar and liquor tanks, as was the case at Chesterfield and Nottingham. The Company were unable to push the slot meters, because they were already supplying to the full extent of their retort power. It would be an advantage to the Company to supply by means of slot meters and cookers, and therefore to raise additional capital.

Mr. BAGGALLAY: Do you know of any case in which Parliament has given compulsory powers to a local authority to purchase the undertaking of a gas company against whom there is no substantial complaint, while the company have got capital unexpended—when they are not at the end of their tether?

*Witness*: That is a subject I am not conversant with.

By the CHAIRMAN: They had an Electric Lighting Order in Huddersfield; but he had not observed that there, or anywhere else, when the corporation also obtained control of the gas undertaking, they did not push the electric business.

### Friday, March 22.

Mr. *Fletcher W. Stevenson*, examined by Mr. WILLIAMS, said that he visited Heckmondwike on the 16th inst., to inspect the gas-works, but was refused admittance. The Bill was a very fair one; the terms as to compulsory purchase being such as to do justice to the vendors. Arbitration under the Lands Clauses Act was provided for. It was in the interest of the gas consumers of the district that the works should be in the hands of the Local Authority. The transfer to the local authority of a gas undertaking almost invariably resulted in benefit, both to the consumers and to the ratepayers. The Company was a statutory maximum-dividend paying concern, and had no interest, therefore, beyond paying the maximum dividend, which they had done for many years. They were not under the sliding-scale, which offered every inducement to a company to do well, because each reduction of price enabled them to distribute a larger dividend. The Company only supplied one kind of meter; and it was very hard for the consumer requiring a larger meter to have to buy a new one himself. Such action was likely to restrict the consumption of gas. It was the first case of the kind he had known. The Company made a charge for fixing the larger cooking-stoves, which was very unusual. They had also been very backward in pushing prepayment meters, by means of which they might have brought about a great increase of consumption. Speaking generally, it was his experience that a gas undertaking would be better developed if controlled by a local authority. The local authority would have every inducement to press consumers to take gas, and to afford facilities for the purpose. The Company for 6½ years had been depreciating their capital by nearly £700 a year, which represented a sum of over £4000. If they had not done this, they could have reduced the price of gas 2d. per 1000 cubic feet. They had also spent out of revenue money that should have come from capital. He calculated that this would equal another 1d. per 1000 cubic feet on the gas sold. The Company had besides this carried forward balances equal to a reduction of several pence more. The Company had looked very well after the shareholders; and he was quite certain that if the undertaking were transferred, it would be better for the consumers of gas in the district.

Cross-examined: In all cases where the local authorities desired the transfer to themselves of a gas concern, it should be allowed. The illuminating power of the gas prescribed in the present Bill was 14 candles. Fifteen-candle power had been largely prescribed in the last twelve months; but it had come to be understood that an equal, if not better, result could be obtained from gas of 14-candle power. This might indirectly cause the consumer to use incandescent burners. The Company had had to reduce their price from the maximum of 4s. 6d. to 2s. 6d. per 1000 cubic feet, because their balances were so large, after paying maximum dividends, that they could not do otherwise.

Other witnesses having been heard in support of the Bill, the case for the promoters was closed.

Mr. BAGGALLAY, for the Company, said the case opened to the Committee was based upon complaints; and he admitted that well-founded complaints were a cause for transferring gas companies to local authorities. This was a statutory Company who had not come to Parliament to change their position. They were not at the end of their tether, because they had unexhausted capital powers of £31,000; and they were not a Company asking Parliament for a new concession. On none of these grounds, therefore, should the Company be expropriated. As to the complaints, a more trivial lot had never been put before a Committee. It was said that the Company had not borrowed their capital at 3 per cent., but had issued shares on which a 7 per cent. dividend was payable. Companies were always started with shares; and borrowing was allowed in the interest of the company, with the object of assisting to maintain the dividend, and to compensate the shareholders for the risk attendant on the enterprise, and often for the company standing out of dividend for years. Parliament, no doubt, restricted borrowing, by prescribing a proportion which the loan capital should bear to share capital. As to the application of revenue to capital purposes, this was admitted to have occurred before 1862; but it received the sanction of Parliament in the Act of that year. He denied that there had been anything of the kind in recent years. Then it was said that the Company had carried forward unduly large balances, instead of reducing the price of gas. In ten years the balance had increased to £1300, which worked out at £130 a year. If this was a matter of serious complaint—if it had ever occurred to anyone connected with the Local Authority before they promoted this Bill—why had they not adopted the proper course, and taken the Company to Quarter Sessions, and had the matter investigated? He pointed out, further, that £130 was equal to a reduction of ⅛d. per 1000 cubic feet in the price of gas; so that if they had been successful in their application, the reduction would only have been to that extent. There was not a tittle of evidence in regard to bad management, unless it was included in the statement that the Company had not pushed their business. Did it look as if they had not pushed their business, when they kept the price down to 2s. 6d. per 1000 cubic feet—nearly the lowest in the district? If the Company had done wrong, the Local Authorities had condoned the offence, because they had not exercised the powers with which they were invested by Act of Parliament, and which enabled them to call the Company to account in case of any irregularity. If there was excessive leakage, it was evidence that there was bad management, insufficient supervision or insufficient expenditure on mains, repairs, &c. But how was it that neither of the two Engineers was asked a word about it? He admitted that the retorts were all in use; but the Company were at the present moment adding to them. The only case of complaint that appeared to have any substance, was as to the danger of the purifiers being over the tar and liquor tanks. But doubtless the Directors would deal with this matter, now that their attention was drawn to it. Mr. Fletcher Stevenson said that the transfer should take place on the ground of public policy; and that in all cases where a local authority desired it, a transfer should be allowed. This was rather a prejudiced attitude—not an attitude adopted by Parliament. He submitted that here no adequate cause for transfer had been made out. Was it desirable that the transfer should take place, unless there was some grievance to be remedied, or some great advantage to be derived by the ratepayers? The real reason for the present application to Parliament was the covetousness—and nothing else—of the Local Authorities, who thought they might get a slice out of the money which might hereafter go to pay the 7 per cent. dividend on the capital not called up on the shares which had been issued. They wanted to get this money to relieve the rates. Was that a proper reason why the Local Authorities should compulsorily acquire the undertaking which had been floated at the risk of the shareholders—merely because the Company had been successful? Each of these Local Authorities had an Electric Lighting Order, which they were going to proceed with. In this case, what was best in the interest of the consumer? Was it not better that fair competition should exist between gas and electric lighting, rather than that the two should be under one control? For, if under one control, the one must practically kill the other, or else neither would give the advantages of a fair competition. Not a single fact essential to his case remained to be proved; and therefore he did not propose to trouble the Committee with evidence. He submitted it would be without precedent to transfer this undertaking to the Local Authorities, having regard to the amount of capital the Company had uncalled, and to the fact that there were no substantial complaints, and seeing that, as he argued, the transfer was undesirable in the public interest.

The Committee then deliberated in private; and on the re-admission of the public,

The CHAIRMAN said: The finding of the Committee is that the preamble is not proved—the promoters have not proved their case

## HOUSE OF COMMONS COMMITTEE.

**Friday, March 22.**

(*Before Mr.* SCHWANN, *Lord* BALCARRES, *Mr.* L. HOGG, *Dr.* MACNAMARA *and Mr.* BONHAM-CARTER, *Referee.*)

HARTLEPOOLS GAS AND WATER (TRANSFER) BILL.

This was a Bill promoted by the two boroughs of West Hartlepool and Hartlepool, for authority to purchase the undertaking of the Hartlepool Gas and Water Company, and to manage it by a Joint Committee.

Mr. PEMBER, K.C., the Hon. J. D. FITZGERALD, K.C., Mr. WEDDERBURN, K.C., and Mr. VESEY KNOX appeared for the promoters; Mr. BALFOUR BROWNE, K.C., Mr. CLAUDE BAGGALLAY, K.C., and Mr. HONORATUS LLOYD, for the Gas and Water Company; and Mr. MOON and Mr. SHAW, for the North-Eastern Railway Company.

Mr. PEMBER, in opening, said Hartlepool had an estimated population of about 26,000 persons, an area of nearly 1000 acres, and a rateable value of £71,000. West Hartlepool, which was really the commercial town, and was incorporated in 1887, had an estimated population of 54,000, an area of 2600 acres, and a rateable value of £218,000. West Hartlepool had grown very rapidly. In 1871, the population was 21,000, and the rateable value £67,000; in 1881, the corresponding figures were 28,000 and £107,000; in 1891, 42,700 and £156,000; and in 1901, the population was estimated at 54,000, and the rateable value was £218,000. The Company were incorporated in 1846; and they had since obtained several Acts of Parliament, most of them authorizing large increases in capital, which showed that the undertaking had been growing. The paid-up capital now amounted to between £600,000 and £700,000; it having been swelled to some extent by the conversion of some shares. In 1898, the Company applied for an Act giving them further capital. By this time an agitation had arisen in favour of purchase; and West Hartlepool asked for the insertion of a clause entitling the two boroughs to bring in a Bill for the purchase of the concern—the Company not to oppose. This demand was often made, but not often granted, because, though a corporation might get such a clause, yet when the consent of the ratepayers was sought subsequently, it might not be forthcoming. Parliament therefore held that the right thing to do was for the boroughs to make up their minds to purchase, and then come with a Bill of their own. The Bill passed, but without the purchase clause. In 1900, the Company promoted another Bill to increase their capital by £250,000, with borrowing powers. West Hartlepool again applied for the insertion of a purchase clause, and also for a sterilization clause with regard to the new capital. The Bill passed; but the Local Authority were unsuccessful in both respects. For a great number of years the Company had been paying, not only full statutory dividends, but also back-dividends; so that there was little or no motive for them continuing their life as a Company. The Corporations thought the present a pre-eminently favourable moment for effecting the purchase, because, although the Company obtained a large increase of capital twelve months ago, they had not spent any of it. The Corporations were interposing to purchase at a time when the Company had fructified as much as they could possibly fructify, and just at the moment when they were starting on a large expenditure of capital. Water supply pre-eminently, and gas supply also, should be in the hands, if possible, of the municipality—the body responsible for the health and well-being of the community. The tendency of modern legislation and thought was all that way. Out of 67 large boroughs in England and Scotland, there were only 19, he thought, who had not the water supply in their own hands. The Company here were now as well-to-do as they could possibly be; and he could not conceive a moment when they could go before an arbitrator and get a larger number of years' purchase, unless there was something in the works to render their statutory income less stable than it appeared to be. This was a joint gas and water undertaking; and it would be extremely difficult—and he thought improper—to buy one portion and not the other. Therefore the Corporations were seeking to purchase the whole concern. The petition of the North-Eastern Railway Company was really against clauses. They entered into an agreement with the Company fifty years ago; and they said it would be very unjust to them, if enforced to its full extent. At present, the Company only required them to pay about half the price which they could be called upon to pay under the agreement. Why they should suppose the Corporations would enforce the higher prices, he did not know. If the agreement was inequitable, let it be torn up; but, in any case, it was a clause matter. The main opponent was the Gas and Water Company, who wholly objected to the passing of the Bill, which they said would prejudicially affect their undertaking. They claimed that, since their incorporation, they had afforded a supply of gas and water in abundant quantity and good quality, and nearly always below the maximum price authorized. He did not know that any very great fault was to be found with the Company; and he would take it, therefore, that their gas and water were fairly good in quality and quantity, and below the maximum price. The promoters, however, did not ask them to part with their property for nothing; they would get an absolute equivalent for giving up their undertaking. The works would be transferred, failing agreement, under the Lands Clauses Act, and every incident of present or future value might be brought before the arbitrator; so that they would get full value. Then the Company said the present was the most inopportune time, in the interests of the ratepayers, for the promotion of the Bill. Why it was an inopportune time he did not know, seeing that in the last three years, when large increases of capital powers had been sought by the Company, the ratepayers had had an opportunity of thoroughly considering the matter.

Mr. *Charles Macfarlane*, Mayor of West Hartlepool, gave evidence supporting Counsel's statement. He said in West Hartlepool there had been very rapid increases in population, houses, and rateable value. The mortgage debt of the Corporation was £161,000, and their borrowing powers £413,000. The port was the fifth of the United Kingdom; and there was every prospect that it would develop to an enormous extent, owing to the opening up of fresh coalfields in the North, to serve which a new railway line was being constructed and the dock accommodation improved and extended. In West Hartlepool, the Corporation realized that they were responsible for the health of the borough, and thought therefore that the water supply should be in their own hands. The Corporation were absolutely unanimous in promoting the Bill; and he had never known a proposal more generally supported by public opinion. The Company supplied two sorts of water—hard for domestic purposes, and soft for trade use. The whole of the hard water was pumped. He did not know that the level of the water in the well varied with the level of the water at the docks. The soft water came from the Hart reservoir. The advantage of the transfer to the ratepayers would be that the mortgage debt established by the payment of the purchase-money would be gradually paid off; so that eventually the water supply would be free of debt.

Cross-examined by Mr. BALFOUR BROWNE: If the Company continued, the people would have to pay for the water year by year; if the transfer took place, they would also have to pay to the sinking fund as well. He agreed that the Company had spent £10,000 on one reservoir under construction, which returned them nothing as yet, and for which they would receive nothing if a transfer took place now.

Sir *C. Furness*, M.P., said he was very largely interested in both the Hartlepools. For years he had held the opinion that the water and gas supply should be in the hands of the Corporation. He regarded the Local Authority as being more likely to look after the health and general welfare of the inhabitants than a Company whose main interest was to make dividends. If the predictions which were made as to the future of the port were realized, the sources of water supply must be extended, and the responsibility for the choice of these new sources should rest with the body responsible for the condition of the supply. Assuming that the shareholders were paid a fair price for their undertaking, and therefore suffered no hardship, he saw no reason why the water supply should not pass into the hands of the responsible people.

By the CHAIRMAN: The principal advantage of the transfer to the town would be in connection with the lower rate at which local authorities, as compared with companies, could raise money. The Hartlepools must be able to borrow money at a lower rate than the ordinary shareholder in a company would be satisfied with.

The Committee then adjourned.

## GAS AND WATER MAINS AND ELECTROLYSIS.

The question of the protection of gas-mains against electrolytic action set up by leakages of current from tramways was the principal subject before the Lords Committee, presided over by Lord Newton, who dealt last Thursday with the Sheffield Corporation Bill. The Bill is to empower the Corporation to make some additions to their electric tramways, of which they have 50 miles already authorized; and the Sheffield Gas Company asked for the insertion of a similar protective clause to that adopted by Lord Camperdown's Committee of last year on the London United Tramways Bill. The wording of the proviso they suggested was as follows:—

> If it be proved that any injury or damage to any mains, pipes, or apparatus of the Sheffield United Gaslight Company shall have resulted from fusion or electrolytic action caused by any currents generated or used for the purpose of electric traction on any of the tramways for the time being belonging to the Corporation, nothing in the said Acts or in this Act shall relieve the Corporation from any liability to compensate for such injury or damage which would have existed but for the passing of the said Acts and this Act.

Among the witnesses called for the promoters was Mr. A. L. C. Fell, the Electrical Engineer and General Manager of the Sheffield Corporation Tramways. He said that every precaution against electrolytic action had been taken in the construction of the lines; and, under the Board of Trade regulations, which were in force in Sheffield, there was no danger of such action to the pipes under the thoroughfares. He had seen pipes in Sheffield which had not been subject to electrolytic action, but which were corroding rapidly. In one case, before the tramways started running, a water-pipe burst in consequence of corrosion. In his opinion, the clause suggested would cause endless litigation. Mr. H. F. Parshall, a Consulting Electrical Engineer, expressed the opinion that the Board of Trade regulations afforded sufficient protection to gas and water companies against electrolytic damage. Mr. R. Hammond gave similar evidence. The electrolytic scare had, he said, been imported from America, and was not based on anything that had been seen in this country.

Mr. Hanbury Thomas, General Manager and Secretary of the Gas Company, called on their behalf, said that they had about 100 miles of mains under the streets of Sheffield, and, of course, many thousands of connecting-pipes. At present the mains were in a very good condition. He regarded it as a dangerous thing to have an electric tramway running close to the mains; and he looked upon it as a mere matter of justice that if the pipes were damaged by electric currents escaping from the rails or motors, the Corporation should be rendered liable to compensate the Company. Professor J. Perry, President of the Institution of Electrical Engineers, said he considered damage to gas and water pipes from electrolytic action as a very serious danger in cases where electric traction was in operation on tramways. When a certain quantity of electricity left the metal and entered a liquid or a damp soil, it carried some of the metal with it. The Board of Trade rule permitted leakage up to 5 per cent.; but if only 1 ampère of current flowed from metal for a week and entered soil of a particular kind, it would remove 1 cubic inch of iron or 2 cubic inches of lead. The Professor laid before the Committee some specimens of gas-pipes which he had been informed had been damaged by leakage of current from the City and South London Railway. He pointed out that these pipes were pitted in a remarkable manner, and said that ordinary corrosion did not show pitting, which was always a sign of electrolytic action. He had no doubt whatever that damage might be done to the gas-pipes in Sheffield by electrolytic action set up by the tramway currents. Mr. Warrington and Professor Ayrton gave similar evidence.

The Committee eventually decided that the clause asked for must be inserted in the Bill.

# LEGAL INTELLIGENCE.

## SUPREME COURT OF JUDICATURE—COURT OF APPEAL.

### Thursday, March 21.

(*Before the* MASTER OF THE ROLLS *and Lords Justices* COLLINS *and* ROMER.)

### Crays Gas Company v. Bromley Gas Consumers' Company.

This was an appeal by the defendants from the judgment of Mr. Justice Bucknill, restraining them from laying their mains near the Farnborough Union, on the ground that the territory belonged to the plaintiff Company. The previous proceedings have been reported in the "JOURNAL."*

Mr. CRIPPS, K.C., and Mr. DANCKWERTS, K.C., appeared for the appellants; Mr. LITTLER, K.C., Mr. R. M. BRAY, K.C., and Mr. CLARKE WILLIAMS represented the respondents.

Mr. CRIPPS said this was an appeal by the defendants in an action brought by the Crays Gas Company to restrain the Bromley Gas Consumers' Company from laying gas-mains near the Farnborough Union, on the ground that there was an old agreement between the Companies under which the territory had been conceded to the Crays Company. Mr. Justice Bucknill held that the Crays Company were right; and he granted an injunction. When the Bromley Company obtained their Act of Parliament, they had powers over the parishes of Chislehurst, Orpington, and Farnborough. The Act was passed in 1865, and the allegation of the plaintiffs was that in that year the agreement was made which prevented the Bromley Company from laying gas-mains near the Farnborough Workhouse. This agreement had been lost; but Mr. May, who was Solicitor and Secretary of the Crays Company in 1865, was called, and gave evidence as to its contents. The answer of the Bromley Company was that, whether there was an agreement or not, there was no record of it in the minutes of either Company in 1865, and that Mr. May's recollection was not to be relied upon. They further said that, if any agreement existed as to boundaries, the division followed the watershed of the Ravensbourne, and consequently the Workhouse was in their territory.

The evidence given in the Court below, and the judgment of Mr. Justice Bucknill, were read; and the further hearing was adjourned.

### Friday, March 22.

On the resumption of the proceedings this morning,

Mr. DANCKWERTS contended that the alleged agreement with regard to not laying pipes in certain places was not in accordance with the provisions of the Act of Parliament of the Crays Company; and apart from the Act they had no power to make an agreement at all. For some time the Company said the watershed of the Ravensbourne was the boundary line; but when they found this would give the Bromley Company the Workhouse, they turned round and set up a new boundary, founded on the recollection of Mr. May. This gentleman's memory, however, could not be relied upon. At one time they fixed one boundary, and at another time a different one; they said the agreement was made in 1848, and then that it was made in 1856; they declared that it was not in writing, and then that it was. On the whole, he submitted that the learned Judge in the Court below had come to a wrong conclusion, and that the appeal ought to be allowed.

Mr. BRAY said the points which the Court had to consider were: (1) Was there an agreement at all between the two Companies? (2) Was the agreement in writing? (3) What were the contents of the agreement? In support of the first point, he referred at some length to the minutes of the Crays Company of 1864, and to the correspondence which passed between the two Companies in 1865, as showing that, after each Company had petitioned against the other's Bill, an agreement was arrived at defining the boundaries, and that the *locus in quo* belonged to the Crays Company. Mr. May's recollection of the agreement being confirmed by documentary evidence, the Judge was perfectly justified in accepting it, and coming to the conclusion he had.

The MASTER OF THE ROLLS, in giving judgment, said that the main question in dispute was whether or not the plaintiff Company had satisfied the onus of proving that an agreement was entered into in 1865, and that the defendants had committed a breach of it. There was no question that the document had been lost, and that no record of the terms could be found in the papers in the possession of either Company; and the plaintiffs' case rested entirely on the evidence of Mr. May. It was conceded on all hands that he was an honest witness; but for the defendants it was urged that his testimony was inaccurate and his memory defective. The Judge who tried the case, and had the witnesses before him, had a far better opportunity of coming to a conclusion on this point than they in that Court had; and he not only believed Mr. May, but came to the conclusion that his testimony was accurate, and acted upon it. In those circumstances, the defendants appealed. After hearing all that could be urged on both sides, he had come to the conclusion that not only was there ample evidence for the learned Judge finding in the way he had done, but he thought he would have been wrong if he had found otherwise. It appeared that in the year 1865 both Companies were in Parliament with their respective Bills, and cross petitions had been filed; and, in order to get rid of them, an agreement was entered into under the provisions of section 58 of the Act of the Bromley Company. The documentary evidence which existed clearly pointed to the fact that some agreement was entered into for the purpose of getting rid of the petitions; and this agreement defined the boundaries exactly as Mr. May had described. At first he thought the dividing line was the watershed of the Ravensbourne, which would put the Workhouse in the Bromley territory; but, after reading Mr. May's evidence, he concluded that this gentleman used the term "watershed," not as delineated on the plan which had been produced, but as referring to another watershed in the hilly districts, which clearly put the building in the Crays Company's territory. Moreover, it must not be forgotten that the Company had acted on the agreement without let or hindrance; they having, in 1884, spent about £800 in laying mains to the Workhouse, and £500 on mains to Fox's brewery. With regard to the legal point raised by Mr. Danckwerts—that the agreement was not in compliance with the provisions of the Act, as two small districts were left unsupplied with gas by either Company—all he need say was that he did not agree with the contention. These places were not in 1865, and were not now, inhabited. If at any time they were built upon, and the residents required to be supplied with gas, proceedings would have to be taken against the two Companies to get the agreement altered so that one or other of them might lay mains.

Lords Justices COLLINS and ROMER concurred.

The appeal was accordingly dismissed, with costs.

* See Vol. LXXIII., pp. 1224, 1383; and Vol. LXXIV., pp. 182, 374, 434.

## HAMPSHIRE QUARTER SESSIONS.—Thursday, March 7.

(*Before Mr.* LINDSAY JOHNSON, *Chairman, Mr.* W. HOLDING, *and Mr.* R. A. BAYFORD.)

### Ventnor Gas and Water Company v. Isle of Wight Guardians.

This was an appeal by the Ventnor Gas and Water Company against the assessment of their works, made on the 20th of October last, by the Assessment Committee of the Isle of Wight Union and the Overseers of Ventnor.

Mr. E. BOYLE, K.C., and Mr. TEMPLE-COOKE appeared for the appellants; Mr. J. A. FOOTE, K.C., and Mr. G. T. WARRY represented the respondents.

Mr. BOYLE, in opening the case, said that in the rate in question the Company, so far as the parish of Ventnor was concerned, were assessed at £3316 gross and £2039 rateable. There were two other parishes—Bonchurch and St. Lawrence; but these were small matters, and were not appealed against. Counsel proceeded to describe the position of the works and the damage caused to them by the sea, near which they were situated, and said the question the Court had to decide came under the Act 6 & 7 Will. IV., cap. 96—that the rate at which the premises should be assessed was that at which they would let to a tenant from year to year, after deducting probable rates and taxes and the annual repairs.

The following witnesses were then called:—

Mr. *J. S. Ineson* said he had been for seventeen years Engineer and Secretary to the appellant Company. The works were close to the sea shore, on a piece of land protected by a wall. The whole front on the east side of the works was in the sea. Witness handed in a plan of the works, and gave evidence to the effect that the property was situated on about the most exposed place on the coast, and was subject to very serious injury by the sea. There was continual damage, and much expense. As to the works themselves, the gasholder had been up 21 years, and the whole of one side, facing the sea, was nearly gone, and would have to be re-sheeted. The average life of a gasholder was about fifty years; but the life of the Company's holder would only be about half the usual time. The beating of the sea on the wall was at times of such tremendous force that it shook the whole building. The gable end of the retort-house would have to be rebuilt this or next year, if it would stand so long. It had already been built twice during the last ten or twelve years. Witness detailed the damage done to the mains in consequence of the land slipping. All the town was more or less on a slight move. Owing to this fracture of the pipes, there had been considerable leakage, which sometimes went on for a long time without being discovered. In 1894 the loss was 2,264,700 cubic feet; in 1895, 2,461,000 feet; in 1896, 2,834,100 feet; in 1897, 3,599,000 feet; in 1898, 3,304,800 feet; and in 1899, 4,069,300 feet. He could not conceive of a worse position for gas-works—it would be impossible. They were accordingly of less value to a tenant than they otherwise would be. In 1898 the Company received for public lighting £410 19s.; but at the present moment they were receiving nothing. The whole of the gas supply to the public lamps had been cut off, and replaced by the electric light, which was also being largely adopted by private consumers. The Company had removed 24 meters down to the end of last year, representing £232 2s.; and besides these private houses, two hotels had discontinued using gas, representing another £226 7s. Since the 31st of December more private houses had ceased taking gas, representing £59. This made £929 actually gone at the present moment. In addition to this, a number of houses had been wired for the electric light, and the occupiers were using it. They were also using gas to some extent; but those houses represented a loss of about £600. These figures together made the actual loss £1529. The Town Hall at Ventnor was being wired; and he was expecting to receive orders to remove the meter and cut off the gas. They had also lost the hospital. The coal for the works had to be brought to Ventnor Station by train from St. Helens, and went down a steep declivity of 285 feet in half-a-mile, and had to be carried in hundredweight bags. This labour added much to the expense. The cost of their coal delivered at the works was about £1 6s. per ton. To show the reduction of the gas supply, witness stated that the quantity manufactured for the year 1894 was 25,259,800 cubic feet; for 1895, 24,596,600 cubic feet; for 1896, 24,000,000 cubic feet; for 1897, 24,000,000 cubic feet; for 1898, 23,876,000 cubic feet; for 1899, 23,525,600 cubic feet; and for 1900, 22,124,600 cubic feet. He did not think there had been any increase in the population of Ventnor during the last decade.

Cross-examined by Mr. FOOTE, witness said he believed the works were built in 1848 or 1850. When originally constructed, there was a large extent of land in front of the works, and houses with gardens at the side, which had been swept away by the sea.

Mr. *G. Humphreys-Davies* was then called, and gave evidence as to the income and expenditure of the gas-works for the past year, with the view of estimating what a hypothetical tenant would pay as rental. He put the gross value at £1972, and the rateable value at £762.

In answer to Mr. FOOTE, witness (who was cross-examined at very

considerable length) said that, notwithstanding the reduced output of gas, the expenses in connection with the works would be substantially the same.

Mr. *Corbet Woodall* was the next witness. He introduced his evidence by stating that the fact that Mr. Ineson had kept the gas-works going was a monument to his capacity and energy. He gave, in considerable detail, calculations and deductions regarding the expenses and revenue connected with the Company's working in the year 1899, and put the rateable value of the works at £653.

Mr. *A. L. Ryde* gave the gross at £2178, and the rateable value at £936. Deducting the assessment of the two small parishes (£108), he estimated the rateable value at £828 in the Ventnor parish.

Witness was cross-examined at some length by Mr. FOOTE.

### Friday, March 8.

On the resumption of the proceedings this morning,

Mr. FOOTE addressed the Court for the respondents. With regard to the loss sustained by the Company in consequence of the electric light, he contended that the only reduction that could be made in the gross receipts would be an additional £290. The evidence of the petitioners, he contended, had been carefully prepared so as not to show any actual loss in any particular year; and they had presented the accounts of the Company in a superficial way.

Mr. BAYFORD asked if the Assessment Committee sat every year.

Mr. FOOTE replied that before coming to the Court, application had to be made to the Committee, who, if they thought right, would make a reduction. In this particular instance, application was made, and the Committee made a reduction of £160.

Mr. BAYFORD asked if the Committee might investigate the accounts.

Mr. FOOTE said they might not, unless they were asked, and then they must do so. The Committee's reduction of £160 was on the rateable value. Counsel proceeded to analyze the calculations given in evidence on the previous day; arguing that the assessment as laid down by the Committee was practically correct. The rateable value of the gas and water undertaking for the parish of Ventnor was put at £1973. At present, the figure as given by the Committee was £1950. Their closeness was accounted for by the fact that the calculation was made in October last. That of the respondents was based on the fact that there had been a drop in the receipts in 1899; but it did not take into account any drop in 1900. The only deduction, therefore, would be to take what would be the further additional loss as compared with 1899—not the loss coming over again, but the increase in the loss.

Mr. *W. A. Mason* was then called for the respondents. He said that in 1891 he conducted for the Assessment Committee of the Isle of Wight a valuation of the railways, piers, and gas and water works. He had had the appellants' books before him; and from them he had made up the valuation before the Court. As to the receipts, he practically agreed with the other side, excepting £927 as to the electric light. Having dealt in detail with the figures he had prepared, he went on to say that the law charges put down by the Company included about £45, which was a proportion of the cost of an appeal made in 1894. That case was done with, and had nothing to do with the appeal. Another sum of £107 was recorded in connection with the case between the Company and the Ventnor Urban District Council in 1897 and 1898. As the result of the proceedings, the appellants had a larger revenue from their water than before. The Company were charging 4s. 6d. per 1000 cubic feet for their gas, and had liberty to charge 5s. 10d., which was a high price to set against the exceptional difficulty of getting their coal.

Mr. BOYLE cross-examined the witness at great length; asking him if he knew that the electric lighting works at Ventnor stood at £187 rateable value.

*Witness* was understood to say that he had ascertained this. Asked whether a tenant coming into the gas-works would not calculate further deductions that might occur through the electric light, he replied that he did not know that he would.

Mr. BOYLE: If a tenant came into these works on your valuation, he would be taking a terrible burden with his eyes shut and his mouth closed.

*Witness* said he thought the District Council would be prepared to take the works at his valuation. As to the increased price of coal, he pointed out that the price of gas had gone up in proportion.

Mr. FOOTE read letters which the Assessment Committee had addressed (without prejudice) to the appellants. Early in December they wrote to the Company offering, in order to avoid the expense of contesting the appeal, to reduce the assessment to £2600 gross and £1600 rateable, and subject to notice of appeal being withdrawn, both parties to pay their own costs. On the 12th of February, the Committee wrote again offering to make the same reduction, and adding that if these terms were accepted they would be willing to pay the taxed costs. Counsel added that the Committee took the replies received to these communications to be refusals, and they were perfectly legitimate refusals. It was only for the sake of peace and saving the expense of the trial of the appeal that the Committee were willing to make the offer—which they thought to be a liberal concession. Counsel further contended that it would not be necessary for the Company to spend in the next decade the same sum on their sea-wall as they had laid out in the last. The Committee had really allowed an additional £160 with regard to loss by the electric light; but the prophesying of loss in the future was not admissible.

Mr. BOYLE, replying on the whole case, said the Company had carefully considered the offer of the Committee; but they believed their figures to be correct, and the methods used had been those almost invariably adopted in the assessment of property of this description. As to the price of coal being counterbalanced by the rise in the price of gas, the Company had the competition of the electric light to deal with; and as they did not want to encourage that, it would be suicidal to raise the price of gas.

At the close of the learned Counsel's address, the Court adjourned. On re-assembling,

The CHAIRMAN said they allowed the appeal, with costs, and made the assessment £2376 gross and £1156 rateable value.

## Claim under the Employers' Liability Act.

In the Westminster County Court on Monday last week, the case of *Goddard v. Gaslight and Coke Company* came before his Honour Judge Lumley Smith, K.C., and a Jury. It was a claim for damages, under the Employers' Liability Act, for personal injuries sustained by the plaintiff. Mr. Scarlett appeared in support of the claim; Mr. Neilson represented the defendants. The plaintiff was a labourer casually employed by the defendants. On the 7th of January last he entered their service at the York Road, King's Cross, station; and on the 10th he was at work unloading coal from railway trucks into hoppers under which there was a small railway on which trucks were run. They were filled and pushed along the rails until they arrived at the spot where it was decided to shoot the load, which was let out of the bottom of the truck, and fell between the rails into a pit beneath. Plaintiff was engaged in pushing these trucks, and had to walk on planks placed by the side of the rails. While doing so a plank tipped up, and he was precipitated into the pit, and sustained severe injuries, from which he had not recovered. It was alleged that the planks were defective, and this was plaintiff's ground of action. He was called, and said he had seen the notice produced requiring the Company's workmen to report any defect, but he said he thought the planks were all right. It was contended that they should have been fixed. The defence was that the planks were in no way defective, and it was said they were not fixed because they had to be lifted, and the coal and coal dust shaken off them occasionally. They had been used in this way with safety for many years. They were not easily moved, and it was suggested that plaintiff had shifted the plank and slipped, and not secured it properly. This was borne out by the fact that those underneath, who witnessed his fall, saw his shovel come down first. The reason for removing a plank being to get off the loose coal, it was clear plaintiff had been using his shovel for this purpose at the time of the accident. His Honour said that the plaintiff, in order to recover, had not only to prove that the plank was defective, but that it remained defective through the negligence of the defendants, and that he did not himself know it was defective. The Jury found for the plaintiff for £50; and judgment was entered accordingly, with costs.

## Slot Meters and Empty Houses.

Robbery from slot gas-meters, especially in empty houses, has been very rife in the Potteries for some time past, and the local Magistrates have recently spent much time in the investigation of offences of this kind. At Stoke-on-Trent yesterday week, William Grocott, a collier, was charged with being on enclosed premises for an unlawful purpose. It was alleged that on the 15th inst. he and another person not in custody were seen to enter an empty house in Boothen, where there was a slot meter. The accused pleaded guilty, and was fined 10s. and 10s. 6d. costs. The Magistrates expressed the opinion that instructions should be given by the Gas Committee to their employees to collect the contents of slot meters in empty houses as soon as possible. At the Burslem Police Court, two youths named Bernard Shingler and Albert Bagguley were charged with robbing three slot meters belonging to the Burslem Corporation. They were both committed for trial at the Quarter Sessions

**Additional Plant for Wokingham Gas-Works.**—At a recent special meeting of the Wokingham Town Council, it was decided to borrow £2500 in respect of the gas undertaking. Part of this sum is required to replace overspent capital (£1021), and the rest is for new mains, prepayment meters, stoves, a new governor, a photometer, a gas-engine, and fittings, &c. The Mayor (Mr. E. C. Hughes) explained that the prepayment meters and stoves would not be adopted until there was a sufficient demand for them; but it was necessary to have the duplicate gas-engine in case of a breakdown. Mr. Seward asked if the capital was overspent with the consent of the Council. The Mayor said the Council accepted the estimate; but it was two years before the work was carried out. Had it been put in hand at the time the estimate was made, they would have saved £1200 or £1300, and there would not have been the necessity to borrow money to pay for it. It was also decided that all proposed further expenditure (except the amount overdrawn) recommended by the Gas Committee in the future should be presented to the Council, and receive the support of a majority of members present, before the works were carried out.

**The Chairman of the Long Eaton District Council Receives a Shock.**—Minutes were presented by a Committee at the meeting of the Long Eaton District Council yesterday week which showed that £80,000 had been offered to the Gas Company for their undertaking; but the Committee were informed that the Company were not disposed to sell on any terms. Remarking upon the report, the Chairman (Mr. J. Winfield) adopted a wrathful tone. He said he wished to speak of the way the Gas Company treated the Committee. He must say he received a shock. He characterized the action of the Company's Directors as a dirty piece of business. An understanding was come to that each side should give figures; but after the Committee had stated the sum they agreed upon, the Chairman of the Company said they were not inclined to sell at any price. He wished this to be known, as the Committee were representing the ratepayers. Mr. Maskell said he had no idea of what was to be said until he entered the room. A meeting of the shareholders had been held subsequent to the first meeting of the Committee and the Directors; and they unanimously decided that they were unwilling to sell. This rather tied the hands of the Directors. He understood that a Sub-Committee decided what should be said to the deputation from the Council. He thought the Directors would repudiate any such construction of their action as had been placed upon it by the Chairman. He did not think there was any desire to take undue advantage of the deputation. He saw in 1875 a parish meeting declined to give £72,000 for the works. The Chairman said his complaint was that the figures were riddled out of the deputation, while the Directors did not give them their figures. Mr. Maskell said he was sorry any misunderstanding had occurred. Personally, he wished the deputation had not given the figures. Mr. Chester agreed with the Chairman that the treatment was unfair. The Directors ought to have told the Committee they were not to give their figures.

# MISCELLANEOUS NEWS.

## HORSHAM GAS COMPANY'S PROVISIONAL ORDER.

### Board of Trade Inquiry.

At the Horsham Town Hall on Thursday, Mr. INGRAM B. WALKER held an inquiry, on behalf of the Board of Trade, into an application made by the Horsham Gas Company for a Provisional Order to confer upon them additional powers.

The Hon. ALFRED LYTTELTON, K.C., M.P., and Mr. G. F. HOHLER appeared for the Company; Mr. E. T. H. LAWES represented the Horsham Urban District Council, who opposed the application; and Mr. C. J. B. HURST attended on behalf of residents in the vicinity of the Company's works.

The Hon. A. LYTTELTON stated, in opening, that the Provisional Order was required to confer certain powers on the Gas Company. It was more for the authorizing of works than for the acquisition of land. The works were erected in 1835; and in 1876 the Company was registered, with a capital of £15,000. In 1877, a Provisional Order was obtained for the raising of additional capital. In 1898, a change of system was decided upon; and in September, 1899, plant for carburetted water gas was installed. By sheer inadvertence, land not authorized by the Provisional Order of 1877 was utilized for the manufacture of the new gas; this being probably due to the fact that there had been a complete change in the directorate of the Company and the Secretary. To avoid the waste of money that would be entailed if the works were shifted, and to put the Company in a secure position, they were seeking to obtain the needed authorization for the works erected. Owing to complaints at the end of 1899, the shaft over the superheater was raised in height from 30 feet to 50 feet. But there were still complaints; and on July 21 last, a summons was taken out by the Urban Council, under section 114 of the Public Health Act. The Justices suspended their decision; and on Dec. 15, as the shaft had been further raised from 50 feet to 72 ft. 6 in., they stated that there had been sufficient compliance with their views, and made no order against the Company. Counsel dwelt upon the change from coal gas to carburetted water gas as a beneficial one; pointing out that in the latter system considerable economy was effected. There was a saving of labour, and great advantage in case of emergency. The Company were prepared to take reasonable precautions to reduce to a practical minimum any possible risk arising from the presence of a greater amount of carbonic oxide than existed in coal gas. Two plots of land scheduled were not now asked to be included in the Order.

Mr. *E. D. Sapey*, the Engineer and Manager of the Company, said that no complaints about the present system were received until the Urban Council issued the summons. He considered that the water-gas process was less offensive than the manufacture of coal gas.

Cross-examined: He had more complaints when the Company made coal gas. The price of the gas was now 4s. 7d. per 1000 cubic feet; it having been put up last October from 4s. 2d. Prior to that, the price was 3s. 9d. It had gone up 1od. in a year. There was not so much danger attached to carbonic oxide gas at night as people made out. The average mixture now was 55 or 60 per cent. of coal gas, and the remainder of water gas. When they started these new works, it did not occur to him that the Company were exceeding their power. The land was there; and he thought they could do as they liked. Upon some of their capital the Company were limited to a dividend of 10 per cent., and on some to 7 per cent. The nuisance, if there had been one, had been materially reduced. There was no chance of making it less.

Mr. *Corbet Woodall* said the evidence before the Magistrates did not at all agree with what he saw on the spot. The works were kept with a degree of care and attention to detail such as he had rarely met with elsewhere in England. He did not think he ever saw works in more beautiful order. The manufacture of carburetted water gas was far ahead of coal gas in the matter of emergency. One of its chief advantages was the reduction of offence.

Cross-examined by Mr. LAWES: The nuisance could not be inherent in the system; and there must have been some slip or carelessness. There might have been a misunderstanding on the part of the operator. As the work was carried on intermittently, and the oil introduced at short intervals, instead of clearing the apparatus of oil vapours before the steam was turned on, the vapours must have been left in when heating recommenced, with the result that the oil vapour came out through the chimney. In his opinion, the Company had done everything they could to modify the smell.

By the INSPECTOR: So far as there was a smell from carburetted water gas, it was less offensive than that from ordinary coal gas.

Mr. *W. J. A. Butterfield*, examined by Mr. HOHLER, agreed with Mr. Woodall as to the excellent condition of the works. He said that, in the manufacture of carburetted water gas, the men worked under less arduous conditions, and amid conditions more conducive to health. He considered that no restriction in regard to the proportion of carbon monoxide was needed.

Cross-examined by Mr. LAWES: He was astounded at the evidence of nuisance given before the Magistrates. There were no restrictions in regard to the proportion of carbon monoxide in gas anywhere in the country.

This closed the evidence on behalf of the Company.

Mr. LAWES intimated that he did not intend to call any witnesses for the Urban Council.

Mr. HURST, on behalf of owners and occupiers of property near the gas-works, pointed out that the Order was to legalize what the Company had been doing for some years past. He contended that the Company ought not to derive any advantage from their unlawful attitude; and that any expense necessitated must be entirely due to their own folly. For years the Company had been supplying the district with gas at an exorbitant price, and paying the shareholders an unreasonably large dividend. Contemporaneously with the bringing into use of this new system, complaints began to be made. The smells were a great nuisance, in whichever direction the wind blew. In spite of all that the experts said, the people did suffer from them. He then proceeded to call evidence.

Mr. *James Harrington*, Chairman of the Horsham School Board, who resides in a house close to the works, said that he should like to see the works taken right away out of the town. The present site was a very unsuitable one.

Mr. *G. W. Flint* said the smells were a great nuisance; but he admitted that since the superheater shaft was raised, he had not noticed them. Property had greatly depreciated in value since the new works were started.

Mr. *W. S. S. Matthews*, who resides near the works, said the smells upset the stomach, and gave a constant headache. They had the smells occasionally now; but he thought the increased height of the shaft had made an improvement.

Mr. *F. W. E. Kinneir*, surgeon, who took the chief part in bringing the matter before the Urban Council, said that raising the shaft had not lessened the humming noise; but they had not recently had so much of the smell.

Over a dozen other witnesses were called; several stating that property had depreciated since the new works were started, but most agreeing that the raising of the shaft had improved matters.

Mr. HURST did not deny that the shaft had mitigated the difficulty; but he contended that there was still such a nuisance that it would be unjust and oppressive if the application were granted.

Mr. LAWES said the only reason the Company escaped a fine when summoned was that the Justices found they had done all they could to mitigate the nuisance. There was still a nuisance; and the question was Should they go on committing this nuisance on unauthorized land? He asked the Board of Trade to insert in the Order provisions as recommended by the Committee who had considered the matter, limiting the proportion of carbon monoxide to 18 or 20 per cent. in the daytime, and to 12 or 10 per cent. from 10 p.m. to 7 a.m. The Company should further adopt a sliding-scale, and have a standard price of 3s. 6d. per 1000 cubic feet.

The Hon. A. LYTTELTON commented on the fact that they had not had a surveyor called against the Order, nor professional evidence of any kind. There might have been occasional smells, but nothing coming within the definition of a nuisance. The health and comfort of the neighbourhood had not been substantially interfered with. None of the limitations recommended in 1898 had been imposed upon any gas undertaking; and he held that it would be contrary to the practice of the Board of Trade to establish a precedent without the further consideration of Parliament.

This concluded the inquiry.

## PROPOSED ADDITIONAL GAS STORAGE AT CATERHAM.

### Board of Trade Inquiry.

On Tuesday, the 12th inst., Mr. INGRAM B. WALKER, one of the Inspectors of the Board of Trade, opened an inquiry at the Masonic Hall, Caterham Valley, into the application of the Caterham and District Gaslight and Coke Company for a Provisional Order to enable them to extend their area so as to include the parish of Woldingham, and to erect two gasholders in a chalk-pit situate at the rear of the Public Hall, Godstone Road. Considerable opposition to the proposal came from the residents in the vicinity.

Mr. A. WEDDERBURN and Mr. W. H. LEESE appeared for the Company; and Mr. D. M. KIRBY represented the objecting residents. Mr. F. B. Winter, Clerk to the Caterham District Council, and Mr. E. Stenning, Secretary of the Public Hall Company, were in attendance.

Mr. WEDDERBURN, in opening the proceedings, said the inquiry arose out of an application to the Board of Trade by the Caterham and District Gas Company for a Provisional Order (1) for additional powers for the storage of gas, and (2) for a small extension of their limits of supply. He would at once deal with the latter question, and would put the matter very shortly, because there was no opposition in regard to it. He explained, by the aid of a map, that the portion of the district into which the Company proposed to go was within the area of the Redhill Gas Company; but it was impossible for that Company to supply it, owing to the lie of the ground. They had therefore ceded it to the Caterham Company. The area in question was outside the district of the Caterham Council, and within that of the Rural District Council of Godstone; and, as these two bodies had not given their consent, it was necessary to ask the Board to dispense with it. The reason the Company required the area was that gas was needed which they could supply; and as there was no opposition, he would ask the Inspector to say there was every reason why they should have it. He now came to the real matter in dispute—viz., the site for the two gasholders. Having given the history of the Company, Counsel said that during the past ten years there had been an increase in the make of gas from 11 to about 19¼ million cubic feet, or an average of 2 millions per annum; the daily make in winter being 160,000 cubic feet. The storage was only equal to 103,000 cubic feet per day; so that if any interruption occurred in the manufacturing process, the neighbourhood would be left in total darkness in a few hours. The Company therefore asked to be allowed to erect two holders upon a certain site nearer the centre of the area of distribution; the present works being two miles distant from Caterham. The objectors to the site selected did not suggest any other, but simply urged that the Company should either increase the storage at their works, or put down larger mains. The answer was, first of all, that there was no room to spare at the works; and, secondly, a larger main would be very much more costly than the holders. Moreover, it would not enable the Company to maintain an unvarying pressure day and night. What they proposed to do was, therefore, if reasonably free from objection, the best thing for everybody. The people who were opposing were those living within 300 yards of the chalk-pit; but they could not see it from their residences unless they took the trouble to look over the fence. The gasholders when full would be 10 feet below the level of the cliff. Counsel then dealt *seriatim* with a number of objections raised by private residents and property owners, and then

expressed his intention of calling witnesses to prove: (1) That additional storage was necessary; (2) that if the selected site was free, having regard to the necessity, from preponderating objection, it was in itself a very proper place; and (3) that by "necessity" was meant necessity for the purpose of giving an efficient supply of gas to Caterham at a reasonable price, quite apart from the proposed extended area.

The following evidence was then adduced in support of the Company's application:—

Mr. *L. H. Hall*, Chairman of the Company, in answer to Mr. WEDDERBURN, said the site of the present works was only 1¼ acres in extent, and it would be a serious mistake, in view of the rapid growth of the business, to occupy any more of the land there with gasholders. In selecting the chalk-pit site, the Directors had expert advice; and it was intended to plant poplars which in a few years would hide the holders. A new main from the works at Whyteleafe would cost about £4000.

Cross-examined by Mr. KIRBY, witness admitted that he did not know of any instance of gasholders being erected in the middle of residential property; but the site the Directors had chosen was by no means in the centre of the best class of residences in the Caterham Valley district. There were larger and better houses in the Harestone Valley. There was just room for two holders, 90 feet in diameter; and there could not possibly be any extension.

Mr. *F. Elliff*, a Director of the Company, and an architect and surveyor, said he was of opinion that if the holders were erected in the chalk-pit they would not be detrimental to the house property in the neighbourhood. He could not conceive a more suitable site for them—in fact, it would be impossible to find one.

Mr. *C. Asprey*, another Director, and an owner of property in the district—some of it being adjacent to the chalk-pit—spoke in support of this site for the holders, and said he had no fear of his property being reduced in value on account of its proximity to them.

Mr. *G. W. Anderson*, Engineer and Secretary of the Company, spoke to the necessity for having more storage. As to an objection raised that there would be a leakage of gas from the proposed holders, and consequently a nuisance caused by the odour, he said there was no smell a few yards away from a gasholder which had been properly constructed. If the Company were prevented from obtaining the Order, they would be put to much more expense in enlarging their main, and this would prevent them from reducing the price of gas, even if it did not compel them to increase it.

In cross-examination by Mr. KIRBY, witness said it was possible to erect holders near the present works, but the mains were not large enough to convey the gas. If they were allowed to put up holders in the chalk-pit, he did not think it would be necessary to lay larger mains until they had four times the present consumption.

The INSPECTOR: Is there any room for a gasholder on your works at Whyteleafe?

*Witness:* There is room; but we may have to remove our works. It might be possible to have another gasholder by doing away with the stores; but I should not be doing my duty to the Directors to recommend the construction of a holder there.

Mr. *H. E. Jones* said he had been for many years consulted by the Company, and was acquainted with their works, as well as with the chalk-pit. The gas supply had increased so much during the past few years that additional storage must be provided; and to put up another holder on the works would be unwise, if land could be obtained for the purpose at Caterham. He was much impressed with the Company's proposal because it pointed to economy; and the effect of this, in the case of any company under the sliding-scale, was to benefit the consumers to the extent of three-fourths against the shareholders' one-fourth. A small main would cost £4500; a larger one, about £6000. Assuming the proposed holders were erected in the chalk-pit, they would suffice. As far as nuisance from them was concerned, he considered the idea purely sentimental. He lived close to some gasholders, and there was no offence whatever. Peaches and all kinds of fruit and flowers were grown quite near the place. There was nothing more unsightly than the chalk-pit; and he could not conceive that the construction of gasholders in it could possibly detract from the beauty of the place. He was bound to acknowledge that the scheme was the cleverest thing he had come across; and he considered Mr. Anderson a very long-headed man. It was the level which made the position desirable.

Mr. *C. C. Carpenter* said he had considered the question of the increase in the consumption of gas at Caterham. Having regard to the existing site of the works, he thought it would be an unwise thing to utilize any space there might be there for additional storage. It was probable that in a few years' time the existing works would be needed for manufacturing purposes alone; and it was more than possible that the Company would have to do away with them altogether. It was absolutely essential that they should have storage elsewhere, and he could not conceive a better site than the one proposed. He was charmed with it when he inspected it the first time. With respect to any odour coming from the holders, there would be no possibility of it; holders did not leak nowadays. There might be a smell near gasworks, but not near the holders. If the Order were refused, both the Company and the consumers would be placed in great difficulty.

Mr. KIRBY said he had decided to call his witnesses before addressing the Inspector.

Dr. *S. Rideal* said there must necessarily be some smell from the tank of a gasholder, as well as leakage from the crown; and in the present case the odour would be very perceptible in the neighbourhood. He was of opinion that it would be highly objectionable and unpleasant; and when residential houses were already located near the spot, it was certainly most undesirable that anything in the way of storage or the manufacture of gas should be brought there.

In cross-examination, witness said he was not a gas engineer, but a chemist, and he would not seriously suggest that a gasholder could be put high up on a hill. He acknowledged that though there might be a few objections, so far as the view was concerned, the site chosen was singularly free from objection; and, with the exception of the houses already mentioned, it was a fair place. Asked if he could mention any instance of complaints being made by people in regard to smell from storage works alone, witness said he did not think he could.

Mr. WEDDERBURN: As a matter of fact, in a case where the works can be seen, and where the gas is reasonably pure, would Mr. Anderson and Mr. Jones come here and tell us what may be controverted. Assuming it to be a case of storage alone, can you controvert what those gentlemen have said?

*Witness:* Yes; they have told us that, in respect of certain gasholders away from the works there have been no complaints. I do not agree with that at all. I know they are offensive. What I say with regard to these cases is that the holders are put up in districts where there is not already a residential population of the kind there is here.

I want you to point out the inconvenience, if you can, arising from storage only?—I have told you that, in my opinion, these houses would suffer.

Mr. *Murray* was the next witness. He said he was trained as an engineer with the late Mr. John Somerville, and had had a great deal of experience in connection with gas-works. He had never known a gasholder from which there was not some smell; and there were none free from holes. He agreed with Dr. Rideal that the occupiers of the houses near the holders would suffer inconvenience therefrom. He had been in Aberdeen, and had noticed a smell 200 yards from gasholders—not from works. He thought the difficulty of the pressure could be met by having larger mains or by increasing it by mechanical means.

Mr. *Drew*, a representative of Messrs. Debenham, said his firm were of opinion that the value of a certain house indicated would be affected by the erection of the proposed gasholders in the chalk-pit. The letting figure was £80 per annum; and in the event of the holders being put up, it would be reduced at least £10 a year. This would represent a loss of £250 on the capital value.

Mr. *G. T. Wilkinson*, a member of the firm of Messrs. T. A. Wilkinson and Sons, gave figures to support the statements that the property in the neighbourhood of the chalk-pit, including the Public Hall and the Hydro, would be prejudicially affected by the proposed holder.

At this stage the inquiry was adjourned.

**Saturday, March 16.**

The inquiry was resumed to-day. Since the adjournment, Mr. Kirby had suggested that, in the event of the Provisional Order being granted, certain clauses should be inserted in it—one being to prevent the Company from acquiring additional land to enlarge the chalk-pit; and the other providing for compensation to people whose property might be depreciated by the erection of the gasholders. Several witnesses (property owners and residents in the immediate vicinity of the pit) were called, and stated that the erection of the holders would prove an eyesore from some of their windows, and would depreciate the property. Mr. Kirby then proceeded to address the Inspector on behalf of the objectors. Mr. Wedderburn replied on behalf of the Company. In the course of his remarks, he pointed out that there had been no active opposition from the Urban District Council, and said that if any smell came from the gasholders, the Council would have power to interfere. The inquiry then closed.

## THE PUBLIC LIGHTING OF LONDON.

The following letter (dated the 16th inst.) by Mr. Livesey on the above subject, in connection with Mr. Corbet Woodall's recent address, appeared in "The Times" last Tuesday:—

I generally agree with, and thank Mr. Woodall for, his trenchant remarks on the public lighting of London, and have suggested that a copy should be sent to every member of the Borough Councils. It is, however, easy to condemn, but proverbially difficult to remedy, the defects of an old-established system. In this case, there are two great difficulties—viz., the heavy cost of an alteration, and what should be its nature and extent. The public lamps are the property of the public authorities; they must therefore bear the cost of any alteration, the loss on the condemned lamp-posts and lanterns, and the cost of new ones. This would be a serious burden on the rates which the authorities do not like to face. Even if they were willing, it would be very difficult for the old Vestry or the new District Council to determine, and to agree upon, the nature of the alteration; and the various Councils would certainly not come to any uniform decision. Improvement from that quarter, in fact, is hopeless.

Therefore, if the thing is to be done, the duty of the Local Authorities must be undertaken by the Gas Companies. Mr. Woodall, when he was Engineer to the late Phœnix Gas Company in 1878, advised his Company to put up improved lanterns and burners in the Waterloo Road, and made a very effective display at a moderate cost. It met with general approval; but when the authorities were asked to bear the cost of its extension, they declined.

About three years ago, the Welsbach Company effected some improvements in their burners that rendered them practicable for public lighting. The Welsbach system, as is well known, greatly increases the light from a given quantity of gas; or, to put it in another way, the consumption of gas in a street-lamp may be reduced by (say) one-half, and the amount of light given by the lamp may be doubled. The charge for gas can, therefore, be considerably reduced; but this is not all gain, because the first cost of installation is greater, and the charge for maintenance is increased. Still, there is a substantial saving. If, therefore, the public authorities would be willing to continue to pay the old rate for a few years, the gas company could make the change, charging the cost to a suspense account to be liquidated by the difference between the annual charge for the old system and the reduced cost of the new. This was proposed to all the Vestries in this Company's district in 1899, and all but two or three out of 23 agreed; and to-day upwards of 17,000 of the 21,000 public lamps in the district have been altered to the incandescent system. In the leading thoroughfares a new lamp-post, christened the "Eddystone," and a new circular lantern, the "South London," both designed by the Company, have been approved by the authorities, and generally adopted. We found the "South London" lantern did not look well on the old octagon

lamp-post, and therefore offered to bear the expense of changing it for the "Eddystone."

I must say, in conclusion, a word for the public authorities—the old Vestries. They met the Company's proposal in the right spirit, and showed they were quite ready for improvement when it was put before them in a practicable form.

## BRITISH GASLIGHT COMPANY, LIMITED.

The Half-Yearly General Meeting of this Company was held ast Wednesday, at the London Offices, No. 11, George Yard, Lombard Street, E.C.—Mr. J. HORSLEY PALMER in the chair.

The SECRETARY (Mr. H. B. Chamberlain) read the notice convening the meeting, and also the report of the Directors for the six months ending Dec. 31, together with the accounts of the Norwich station as required by the Company's Act. The report stated that the balance of profit was £23,962, after deducting the sums mentioned below, and adding £129 from the Hull reserve fund, £684 from the Potteries reserve fund, and £559 from the Trowbridge reserve fund—the parliamentary interest at those stations not having been realized by these respective amounts. The deductions were as follows (omitting shillings and pence): Income-tax, £1291; Hull debenture interest, £997; Norwich debenture interest, £902; Potteries debenture interest, £380; and Trowbridge debenture interest, £166—total, £3737. Regarding the Hull station, the gas-rental showed an increase of £7961, as compared with that of the corresponding period of 1899; the price of gas having been increased from 1s. 10d. to 2s. per 1000 cubic feet from July 1. Coke presented an increase of £7873; tar and tar distilling an increase of £85; and ammoniacal liquor and sulphate an increase of £313. Coal cost 15s. 2d. per ton, against 11s. 8d. per ton. Coke realized 17s. per ton, as compared with 10s. 2d. per ton. The gas sent out was 531,837,339 cubic feet, as against 467,459,294 cubic feet, or an increase of 64,378,045 cubic feet—equal to 13·77 per cent. Of this quantity, 52,170,000 cubic feet was supplied in bulk to the Corporation for the supply of the Old Town. The profit realized was £129 less than the parliamentary interest; and this sum had been taken from the reserve fund—leaving a balance of £39,688. Respecting the Norwich undertaking, the gas-rental showed an increase of £6106, as compared with that of the corresponding period of 1899—the price of gas having been increased from 3s. to 3s. 6d. per 1000 cubic feet from July 1. Coke exhibited an increase of £812; and tar and ammoniacal liquor a decrease of £446. Coal cost 21s. 11d. per ton, as against 15s. 10d. per ton. Coke realized 11s. 11d. per chaldron, as compared with 10s. 1d. per chaldron. The gas sent out was 189,179,000 cubic feet, as against 177,608,000 cubic feet, or an increase of 11,571,000 cubic feet—equal to 6·51 per cent. The profit realized was £3044 less than the parliamentary interest. Concerning the Potteries station, the gas-rental showed an increase of £3192 over the corresponding period of 1899—the price of gas having been increased from 2s. 3d. to 2s. 8d. per 1000 cubic feet as from July 1. Coke exhibited an increase of £2386; and tar, ammoniacal liquor, and sulphate an increase of £204. Coal cost 15s. 10d. per ton, against 10s. 9d. per ton. Coke realized 11s. 11d. per ton, against 7s. 3d. per ton. The gas sent out was 187,524,000 cubic feet, compared with 187,148,000 cubic feet, or an increase of 376,000 cubic feet—equal to 0·20 per cent. The profit realized was £684 less than the parliamentary interest. This sum had been taken from the reserve fund; leaving a balance of £19,792. With regard to the Trowbridge works, the gas-rental showed an increase of £577; the price of gas having been increased from 3s. 2d. to 3s. 6d. per 1000 cubic feet from July 1—the discounts remaining the same. The residual products realized £232 more than in the corresponding period of 1899. Coal cost 19s. 2d. per ton, against 14s. 11d. per ton. Coke realized 16s. 4d. per ton, as against 12s. 6d. per ton. The gas sent out was 29,958,763 cubic feet, as against 29,125,006 cubic feet, or an increase of 833,757 cubic feet—equal to 2·86 per cent. The profit realized was £559 less than the parliamentary interest. This sum had been taken from the reserve fund; leaving a balance of £2044. As to the Holywell station, the gas-rental showed a decrease of £83. The profit from the whole of the stations added to the previous balance of profit and loss amounted to £51,423. From this the Directors recommended a dividend at the rate of 10 per cent. per annum; clear of income-tax. This would amount to £23,000, and leave a balance of £28,423.

The CHAIRMAN, in moving the adoption of the report and accounts, said his remarks would not be very long, because he thought that, on the whole, the report was thoroughly satisfactory. The amount of profit on this occasion was £23,962; but it must be remembered that they had to provide for an increased dividend this half year, seeing that for the first time they made a payment on account of the 2000 shares issued last summer, or, taking the total, they had to pay on 23,000 shares, instead of 21,000. Therefore he considered this was a gratifying statement he had to make—that the Directors were not only able to pay the increased dividend, but in addition to pay the dividend free of income-tax (amounting on this occasion to £1291), and to carry £962 to the sum already in hand, and this notwithstanding the difficulty they had had to contend with of the increased price of coal, though they had been assisted, of course, by the material advance in the price of coke. With regard to the work at the stations, the shareholders would remember that, at the last meeting, he spoke about the large expenditure they had had to incur at Hull. The amount of capital that had been placed to the Hull debit during the last six months was almost £62,000, or to be precise £61,689. This was in consequence of the large amount of gas which the Company had now to deliver to the Corporation for their area of supply. The Company's business at Hull had progressed very favourably up to a certain point. During the latter months of the year, owing he presumed to the very great cost to the manufacturers in that neighbourhood of coal, ironwork, &c., the consumption of gas decidedly fell off; but the decrease in consumption would, he hoped, when the price of coal, steelwork, and ironwork resumed a more normal level, be recovered—in fact, he looked forward to this condition being reached at no distant date. He did not think there was any anxiety in the minds of the Directors with regard to the falling off in consumption which took place in the months of November, December, and January. The price of gas at Hull had only been increased 2d. per 1000 cubic feet; but notwithstanding the smallness of this rise, they had made their dividend, except the very moderate amount of £129, which was taken from the reserve fund. The reserve fund at Hull amounted to the large sum of nearly £40,000. They always looked to treating their Hull consumers with the greatest liberality; and therefore they only raised the price 2d., though he understood their neighbours at Southcoates advanced their charge by 3d. While on Hull affairs, he should like to make a few remarks in connection with the Bill the Company were promoting this session. As he informed the shareholders on the last occasion, the Directors had been on the most friendly terms with the Corporation; but they objected to the Company raising such a large amount of capital as was proposed in the Bill. He (the Chairman), Mr. Corbet Woodall, and Mr. R. S. Gardiner, accompanied by the Secretary and the Solicitor, went to Hull, and were met in the most friendly and conciliatory spirit; and, he need hardly say, the same spirit was exhibited by the Directors to the gentlemen they met. They then thought they had come to an arrangement by which no opposition would be necessary. Since then, however, the Corporation had made claims on the Company which he did not think were entirely called for; but he hoped they would not have a fight in Parliament. Still the Directors, while they could be conciliatory, could also be firm. They had told the Corporation what they were prepared to give them; and there they intended to stand. He trusted the Corporation would see the necessity of meeting the Company in the same way that the Directors had met them. He would not say more, because the matter was in a sense *sub judice*. With regard to the other stations, things had gone on very quietly. They had had no great expenditure either at Norwich or at the Potteries; but they would have to spend money at the latter place. In fact, at the present moment, they were constructing a gasholder tank there. During this year they would have to build a new holder there, and probably next year begin the erection of a new retort-house on land acquired the year before last. At Norwich, things were going on smoothly; and they had had no difficulties with the town which had not been readily smoothed over. With regard to Trowbridge, they had had to take from the profits there a certain amount to meet the interest on the new work which was completed last year, and which was, of course, not yet earning its full quota. They had to build a new holder there and to remodel the works; and as the increase in business went on, these additions and improvements would gradually pay their way. Still at Hull, the Potteries, and at Trowbridge, they had large reserve funds to meet these claims as they arose. This was really all he had to say with regard to the business of the half year; and he thought the shareholders would agree that the accounts fully bore out all he had stated.

Mr. CORBET WOODALL seconded the motion.

Mr. J. M. GIBBS congratulated the Directors upon having been able to pay a 10 per cent. dividend, notwithstanding the increase of capital, the advanced price of coal, and the higher income-tax. This was very satisfactory to the shareholders.

The CHAIRMAN remarked that he did not know what were the views of the Chancellor of the Exchequer as to the future; but it had become a serious matter to pay dividends free of income-tax. There were hardly any companies working under Acts of Parliament who paid dividends free of income-tax. He believed all the great railway companies deducted the income-tax before paying their dividends; and he must really warn the shareholders that, if the income-tax was raised to any considerable degree in the future, it would become a moot point as to whether the Directors would be able to continue to pay the dividend free of income-tax. It was now a serious burden on the Company to do so.

The motion was unanimously carried.

On the proposition of the CHAIRMAN, seconded by Mr. FREDERICK WILKIN, a dividend of 20s. per share, clear of income-tax, was declared.

Moved by Mr. R. STEVENS, and seconded by Mr. A. G. BURNEY, a hearty vote of thanks was passed to the Chairman and Directors for their able management during the half year.

The CHAIRMAN having responded,

Mr. CORBET WOODALL moved a similar vote to the Secretary and other officers of the Company. He remarked that the shareholders all knew the Secretary, and so he need not say anything in regard to him. But as to the men who were in charge of the works at a distance from town, he should like to say the Company were to be congratulated. Their officers, he supposed, had necessarily a freer hand, and a wider responsibility attached to them, than in the case of a Company where the Board of Directors met in the town and very often upon the works. The Company had in these men very efficient officers; and the success which attended their operations in all the towns was a tribute to their capacity and devotion.

Mr. R. S. GARDINER seconded the motion, which was very heartily agreed to.

The SECRETARY responded; and the proceedings terminated.

**Profits on Leicester Gas.**—Last week the figures were given (p. 767) as to the working of the Leicester Gas Department in the twelve months to December. It was shown that £27,000 was realized as profits on the gas undertaking, which might be used to relieve the rates. A part of this large amount was obtained by adding 2d. per 1000 cubic feet to the price of gas; and as £27,000 is about equal to a borough rate of 9d. in the pound, the "Leicester Times" points out that gas consumers are practically rated to this extent for the benefit of the town.

**Money Bill of the London County Council.**—The London County Council have given notice of their intention to introduce a Bill to define the amounts which they may expend for the various purposes for which an outlay of capital is required in the financial year commencing on the 1st prox., and (on account of the next financial year) during the following six months. Among the purposes specified is the execution of any powers which may be conferred on the Council if the Bills now in Parliament become law—including the Water (Purchase) Bill.

## TEIGNMOUTH GAS SUPPLY.

### The District Council and the Gas Manager.

Having decided a fortnight previously (see *ante*, p. 711) to give the Gas Manager notice to terminate his engagement, the Teignmouth District Council met yesterday week to consider a proposal to rescind the resolution. Colonel Morrison, the Chairman of the Council, presided, and moved that the resolution be rescinded. He explained that he was not able to be present at the previous meeting, and suggested that the motion, which was moved without notice, had been rather sprung upon the Council. He agreed that the time had arrived when they should cease to retain the Manager's services; but they could have got rid of him in a more considerate manner. He added that Mr. Stormonth was the cheapest candidate before them at the time of his appointment, and that since he took charge of the works he had had a very rough time. Considerable discussion followed as to what would be the effect of rescinding the resolution. The Clerk (Mr. A. P. Dell) advised the Council that Mr. Stormonth would cease to be an officer of the Council on the 8th of April unless he was reappointed, and also that they could not withdraw the notice given to him without his consent. Mr. Jarvis said it was the wish of the Gas Committee that the Manager should be afforded an opportunity of resigning. No charge had been brought against him; and the proper course would have been to ask him to resign. Mr. Smith declared that the Council were to blame for the difficult position in which they found themselves. They needed a highly-trained scientific man, and they had paid labourer's wages. He wondered the Manager had done as well as he had. Mr. Bird thought that their offence was that they dismissed Mr. Stormonth without giving him a chance of answering a letter which was received by the Gas Committee. The proper course would have been to suspend him until he had refuted the allegations made. Mr. Banbury, the Chairman of the Committee, remarked that ever since his appointment the Manager had met with the greatest opposition. The Surveyor opposed him because he had lost the management of the gas-works, there was opposition at the works through the breaking up of a family circle, and opposition in the Council because none of the vessels belonging to members had been chartered to carry coal. Personally, he was sorry he undertook the chairmanship of the Committee. After some further discussion, it was decided to adjourn the meeting to give an opportunity for consultation with the Manager. On the following day, when the Council again met, the proceedings were conducted in private. The majority decided to rescind the resolution dismissing Mr. Stormonth.

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In connection with the proceedings reported above and those noticed in the "JOURNAL" for the 12th inst., we have received the following letter from Mr. Stormonth:—

SIR,—My attention has been called to an error in the paragraph on Teignmouth in your issue of the 12th inst. There has been no shortage in the supply of gas at Teignmouth this winter, and on no single occasion has the ordinary pressure been reduced. We have had trouble with naphthalene; and on one occasion—two houses close together—the supply ceased for a short time, although the lamps in the vicinity, which work with Welsbach bye-passes, did not go out. To twist this so as to comply with your paragraph is surely wrong. Perhaps your correspondent's wish was father to his thought. A partial lie is harder to deal with than one entirely false. I have had the "JOURNAL" for many years, and have never before had reason to complain. The *estimated* profit of £200 is after paying loans and interest thereon; or, to be wholly true, the estimated profit is £1600, the estimated surplus profit £200.*

I will take this opportunity of warning any manager who would be tempted to apply for a works like Teignmouth. The treatment I have received is without a parallel; and, if you will permit me, I will give you the history of my work here for the benefit of your readers. When I was appointed in the winter of 1899-1900, the works were in a deplorable state. At the first meeting I reported fully on the works, and declined to be then responsible for the supply of gas running short. However, by reducing pressure and by a liberal use of cannel, I succeeded in keeping up a constant supply. The Council agreed to my plans for alterations at the works, in place of others which were prepared by the Surveyor of the town, who, when the Local Government Board Inspector heard the Council's application for permission to alter the plans, admitted that he had no knowledge of gas-works. Matters were going along all right; but, alas! an election took place, and two of the old amateur managers got on the Council, and have succeeded in making the place such that Donnybrook fair would be tame in comparison with the meetings. These members blocked every measure, to prevent the gas-works being a success; but when the coal contracts showed we should have to pay £1100 more for coal, they insisted that I would be unable to make sufficient to pay interest on loans. The year is not out till end of this month. They have, however, heard that the returns will show an improvement of £800 over and above the extra outlay on coal, notwithstanding that an increase made in the price of gas brings in only £125. The climax was reached when, at a meeting of the Council on the 5th inst.; one of these two members proposed a motion, without notice, that the Manager should be dismissed; and three others supported him. The rest of the members of the Council present, seeing that they were outnumbered, did not vote. The Gas Committee were instructed to procure another Manager; but when the Committee met, they declined to do anything of the sort. Six of them signed a requisition calling a special meeting of the Council to rescind the resolution. This was carried by eight votes to four. One of the five now voting for the rescinding, being a candidate for re-election on the 25th inst., has placed his seat on the Council in danger.

*Gas-Works, Teignmouth, March 22, 1901.* THOS. STORMONTH.

* In reference to these remarks of our correspondent, we may state that the paragraph referred to was received from our regular representative in the West of England, who resides at Plymouth, and, as far as we are aware, is not acquainted with anybody at Teignmouth.—ED. J.G.L.

## THE ELLAND GAS COMPANY'S BILL.

### The District Councils' Suggestions and the Company's Replies.

Our readers are aware that the District Councils of Elland, Greetland, and Stainland have raised objections to certain clauses of the Bill promoted by the Elland-cum-Greetland Gas Company. A deputation from these bodies lately had an interview with the Directors, and submitted twelve suggestions for their acceptance. They were as follows: (1) The standard price of gas to be reduced from 4s. to 3s. per 1000 cubic feet. (2) The illuminating power to be increased from 14 to 16 candles. (3) Authority to test, without notice, for illuminating power, purity, and pressure. (4) Investment of reserve and insurance funds in Government or other securities. (5) Option of the District Councils concerned to purchase the undertaking within a period of two years, on a basis to be declared. (6) Restriction of amount for issue of new capital (£45,000). (7) Auditors to be Chartered Accountants of standing, and disinterested. (8) Discounts for prompt payment (domestic supply). (9) Map showing mains to be kept for inspection. (10) Borrowed money to be raised either by auction or tender. (11) Gas for power and cooking to be supplied at a lower price. (12) Discounts to public bodies and trade. The Company's Solicitors, Messrs. Wright and Co., replied as follows:—

We are instructed by the Directors of the Gas Company to say that they have given the fullest consideration to the questions submitted by the deputation of members of District Councils which met them, and to answer the twelve questions submitted.

1.—The Directors cannot, in addition to the concession of an increase in the illuminating power of the gas supplied, advise the shareholders to reduce the standard price of gas. The standard price affects less than half the capital of the Company.

2.—The Directors have undertaken to increase the illuminating power of the gas by 1-14th—that is, from 14 to 15 candles—without any corresponding increase in price; and this is equivalent to a considerable reduction in the price of gas.

3.—The Local Authorities have already full statutory power, by a gas examiner appointed by the Justices on their application, to test the illuminating power and purity of the gas at the testing-place. The testing of the pressure of the gas is regulated by clause 32 of the Bill; and two hours' notice is to be given of the time and place where the testing will take place. This is a usual and reasonable provision.

4.—Provision is made by the Gas Company's present Acts, and by clauses 26 and 28 of the Bill, for the investment of the reserve and insurance funds. For many years past these funds have been invested, and the income from the investments, which might have accumulated, has been applied for the benefit of the gas consumers in the reduction of the price of gas.

5.—The Gas Company do not desire to sell their undertaking.

6.—Your deputation did not suggest any limit to the new capital to be raised. Any new capital will be dealt with under the auction clauses, and no shareholder will have any priority. All new shares are to be disposed of by public auction or tender, and the premiums applied as capital not paying dividend. No additional capital will be raised until it is required.

7.—The appointment of Auditors does not affect the Local Authorities. It is regulated by the Company's Acts of Parliament, and is made by the shareholders.

8.—When the Gas Company applied for the Order of 1878, the Elland Local Board strongly objected to the proposal fixing the standard price of gas, subject to a discount for prompt payment; and, in deference to the views of the Board, the principle of a fine on non-payment was substituted. The Directors are of opinion that the price of gas should, as far as may be, be alike to all consumers, without discounts, and that no preference should be given.

9.—A map showing the lines of the Company's mains is kept at the gas-works, and it has always been open for examination by any consumer or intended consumer who desired to see it.

10.—It is undesirable that the raising of borrowed money should be required to be either by auction or tender. The Gas Company have no difficulty in obtaining the loans they require at reasonable rates of interest not exceeding 3½ per cent.

11.—The Directors do not consider that (except in certain special cases) gas for power or cooking should be supplied at a lower rate than for lighting. Such a system would require duplicate meters, pipes, and fittings, which would necessarily be costly.

12.—The Directors are of opinion that the price of gas should be the same to all consumers, and that it would be inequitable to require the working classes, who are regular customers, to pay a higher price for gas than manufacturers and others who take gas only intermittently for trade purposes. The Directors' view is that the public are best served by charging the lowest uniform price for gas, and that householders should not be charged at a higher rate in order that a discount might be allowed to local authorities and millowners. You will no doubt note that the increase in the illuminating power of the gas which the Company propose to give is equivalent to a somewhat important reduction of the standard price of gas, and, in addition, in the new Bill it is proposed to abandon the fine of 5 per cent. upon gas accounts in arrear

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**London County Council and Shareholders in Joint-Stock Companies.**—The motion on this subject which, as stated in the "JOURNAL" last Tuesday, stood in the name of Mr. Spokes upon the *agenda* for the meeting of the Council that day, was agreed to.

**The Adventures of a Vigilance Committee.**—Considerable amusement has been caused in Colwyn Bay by the adventures of a self-styled "Vigilance Committee," who undertook to oppose the Bill being promoted by the Colwyn Bay Council for the purchase of the Colwyn Bay Gas-Works, in which project they have received the sanction of the ratepayers through a poll. The "Vigilance Committee," not content with getting up a petition against the Bill, proceeded to London; but on presenting themselves to the authorities were politely informed that they were too late, and they had to return sadder and poorer men.

## ELECTRIC LIGHTING NOTES.

The public lighting question was again before the Shanklin District Council last Tuesday, when it was decided to leave to the new Council the settlement of the question of whether or not a poll of the ratepayers should be taken on the proposal to adopt electricity.

At the meeting of the Torquay Gas Company last Thursday, Mr. J. Young, referring to the municipal electric lighting scheme, said the arc lamps in Torbay Road cost the town £1350 a year, and they had displaced twice the number of gas-lamps which cost £168. In order to bolster up the electric light undertaking, the ratepayers were paying more than £1000 a year for these lamps.

Shortly after seven o'clock on Saturday evening, the public electric light supply in Sheffield suddenly stopped. The Lyceum Theatre was in total darkness for about twenty minutes, and also the Empire Palace, as well as other public buildings. In the case of the Lyceum, the orchestra played during the interval necessary to start the gas footlights and put the remainder of the gas service in the theatre into working order.

Penzance is apparently less enamoured of the prospects of electric lighting than it was some time ago. At the last meeting of the Town Council, the Electric Light Committee reported that they had had under consideration the report of an expert, but had not come to any decision at present. A member of the Council thereupon asked if the Committee had any idea of abandoning the scheme altogether; and he suggested that they should consider this among the other proposals. The Mayor said the Committee had several suggestions before them, and this was among the number.

"It has been a common experience," the "Stratford Express" says, "to find an electric lamp-post doing duty as a sort of musical-box, and failing in its duty as an upholder of light. On Saturday night last [the 16th inst.] all the electric lamps in the borough failed. They neither gave light nor sound for a period of almost half-an-hour. Perhaps some deduction will be made in the rate for light and music not supplied. Shops having their supply of electricity from the Corporation were suddenly left in darkness, and shopkeepers were glad to fall back upon lamps and candles where there was no gas to be had. The failure of the light was due to an accident to the machinery at the electric light works." The Corporation referred to is that of the borough of West Ham; and the local paper has let them down very gently in regard to this serious failure. If the Gas Company had been the cause, a column would not have sufficed for the torrent of abuse which would have followed.

The Board of Trade inquiry to consider the application made to them for an alteration of the regulations for ensuring a proper supply of energy was resumed on Monday last week, at the Westminster Town Hall, before Sir Courtenay Boyle. The previous proceedings have been already noticed (*ante*, pp 636, 704, 771). The Hon. A. Lyttelton, K.C., in summing up the case for the London County Council, said it was recognized that the proposed change was one which the Board of Trade were prepared to authorize, and the simple question was as to the terms of that authorization. The Council had satisfied themselves that the result of the change would not be such as the promoters wished them to believe, and it was questionable whether it should be allowed at all; but if it were permitted, it should be made at the expense of its promoters. Major Cardew was then called by Mr. Littler, K.C., on behalf of the Windsor Hotel and the Junior Constitutional Club. Witness expressed the opinion that the consumer would not derive any advantage from the higher voltage proposed; the benefit would rest entirely on the side of the Companies. The terms on which the consumers should be asked to consent were that the Companies should pay all the expenses of the change, and put the consumer in as good a position as he was at the present time. Mr. Littler, in summing up his case, contended that there was not the slightest ground for suspicion that his clients desired to take advantage of their position to act in an unfair way. Mr. Balfour Browne, K.C., on behalf of the Companies, asserted that the proposed alterations were for the benefit of all parties. The inquiry was again adjourned. The final stage of the inquiry was reached on Friday morning, when Mr. Moon addressed the Inspector on behalf of the Chelsea Company. He first referred to the suggestion which had been made by the Board of Trade as to open arbitration, to which, he said, the Company were perfectly willing to agree. The arguments of the County Council as to an indemnity to be given to the consumers were based on two grounds—first, that the consumers had a right to veto the change; and, secondly, that the 200-volt lamp was not efficient. He had already dealt with the first ground; and with reference to the second, in new installations invariably, and in the great majority of cases where an old installation was changed, the 200-volt system was adopted. The real matter of controversy was the relative efficiency of the 200-volt lamp—as to whether a proportionate result was obtained compared with the cost. The evidence of Professor Kennedy, Colonel Crompton, and Mr. Still was practically uncontroverted. He had a strong objection to the Arbitrator being fettered as suggested by the County Council, although he was perfectly willing to run the risk of an open arbitration in accordance with the proposal made by the Board of Trade. Mr. Glen, on behalf of the Paddington Borough Council, pointed out that Professor Kennedy had admitted that there would not be any change in the light owing to the alteration of voltage, and also that it was possible the present plan was more economical. Therefore it must be disadvantageous to the consumer to be forced to adopt the 200-volt lamp system in all cases. The lamps of 8-candle power and less, which were in general use, would not stand the increased pressure; and this fact would involve alterations on the consumers' premises. If the change were made, it should only be in the way suggested by the London County Council. Mr. Danckwerts contended that, although a perfect installation for 100-volt lamps would apply for the higher voltage, perfect installations were practically non-existent. Consumers had vested rights which could not be taken away except where a public benefit was shown, which was not the case in the present instance. Mr. Roskill, replying for the City of London Company, denied that any vested rights existed. The Board of Trade had the power to alter the regulations when they thought fit. The clause drafted by the Department gave the consumers all the protection they desired. The inquiry then closed.

## LONDON COUNTY COUNCIL AND THE WATER QUESTION.

### Deputation to the Local Government Board.

Last Thursday, a deputation from the Parliamentary and Water Committees of the London County Council waited upon the President of the Local Government Board (Mr. Walter Long) to urge upon him in accordance with the resolution passed at the meeting of the Council on the 12th inst., the desirability of allowing their Water Purchase Bill to pass its second reading. The deputation included Mr. A. M. Torrance (Chairman), Mr. J. M'Dougall (Vice-Chairman), Mr. G. L. Gomme (Clerk), Mr. H. L. Cripps (Parliamentary Agent), and Sir Alexander Binnie (Engineer).

Mr. TORRANCE having introduced the deputation,

Mr. T. M'KINNON WOOD said they felt they owed an explanation to the President for asking him for a second opportunity of expressing their views on the London Water Question; and they thanked him for acceding to their request. On the previous occasion, the President had expressed the opinion that recent events had not emphasized the view the Council supported—that they should be the authority to purchase the Water Companies' undertakings. He (the speaker) admitted that the question of public opinion was an important one. The General Election in October was fought on Imperial rather than on local questions; but since then they had had an election which was largely fought on water matters, and every candidate was heartily opposed to the new regulations put forward by the Companies. A strong opinion was expressed that there should be no further delay, and that a settlement of the question had already been too long deferred. They felt that the control of the water supply should be in the hands of the ratepayers, and that a Trust which did not give control to the Council would not satisfy them. When the proposal to wait upon him (the President) was made at the meeting of the Council, 91 were in its favour and only 7 against it. Every Moderate who took part in the debate was in favour of purchase; so that for the first time he could speak for a united and undivided Council. During the past six years, since they introduced their Bill, seven out of the eight Water Companies had obtained increased parliamentary powers, with further right to take water from the Thames and raise additional capital. He contended that the complaints of the Water Companies against the Council's proposals were groundless, and that the dividend would be secured to them on their own property and on the rates of London. As to the question of future management, this must remain unsettled until the Council got possession of the undertakings. The speaker then alluded to the constitution of the Water Board suggested by the Royal Commission, and urged that the admission of representatives of the Thames and Lea Conservancies was a new departure. These bodies, he said, had no interest in the question except that of selling water to the Companies, which was a reason for excluding them. London was only to have one-third of the representation, though the interests, in rateable value and population, were 80 or 90 per cent. of the whole. By their Bill, the Council proposed to supply outside local authorities in bulk on terms not more onerous than they were under the Companies, to give them the right of distribution, and to enable them to join on fair terms. He submitted that the Bill formed a basis for a settlement of the question on a system of proportionate representation. He contended that they had a mandate from the ratepayers, who were anxious for an immediate settlement; and, in view of all the facts, he submitted that their request that the Bill should be allowed to proceed was a reasonable one.

Mr. BEACHCROFT followed, and urged that a settlement was greatly needed. He expressed the opinion that, if the new Borough Councils were polled, by far the greater number would assent to the purchase of the water undertakings.

Mr. LONG, in reply, acknowledged that Mr. M'Kinnon Wood had accurately quoted what he had stated to the previous deputation from the Council; but this was not, he said, the main ground upon which he had rested his decision. He was not at all prepared to assent to the views of those who represented the Council, and especially the victorious party in the Council, as to the part which the water question had played in the recent elections. After a very careful study of the election addresses issued, and of the speeches delivered, during the contest, he had come to the conclusion that, while undoubtedly the purchase of the water undertakings was before the electors in a specially prominent manner, it was to a very large extent pushed on one side by the question of the new regulations proposed by the Water Companies, to which the majority of the candidates had addressed themselves with considerable zest, which appeared to justify the opinion that they thought they had got something which would be of service to them. Some gentlemen of great prominence had done the Local Government Board and himself the honour of referring to them in connection with those regulations, and had stated that if a particular return were the result of the election, the policy of the Department would be based upon that return, and would be injurious to the electors of London. Therefore he was not prepared to accept as an unanswerable argument the statement that the election had turned in such a way upon the Council's water proposals as to materially alter the position which existed in November last. He fully admitted that there was absolute unanimity that the Water Companies' undertakings must be purchased and handed over to some controlling body; but whether there was anything like the same agreement as to what that body should be, was a question upon which he entertained a very different opinion. It was constantly asked why London should not be allowed to occupy the same position as other great towns in England in reference to municipal affairs. Surely that was a matter for them to settle among themselves, and not to approach the Government upon. With regard to the Bill, which was the same now as it was in November, he presumed that the Government were asked either to stand aside altogether and take no part in the debate, or to recommend the House of Commons to adopt the Bill and send it to a Committee. That was a very great deal to ask of the Government. The matter affected not merely the water consumers of London, but also those in the outside areas, in so far as they were consumers of London water as their main source of supply; and they had not so far been able to come to an

agreement with the people of London. With regard to the Royal Commission, nobody would deny that the inquiry was one which was entitled to receive the respectful consideration of those who had to approach the examination of the water question. Their report was considered by the late Government and by his predecessor. Upon the three main questions governing the purchase of the water undertakings—viz., the constitution of the managing body, the manner in which they were to deal with the outside authorities, and the financial question or method of purchase—the Commission made definite recommendations. To them the late Government announced their adhesion; and he, as the representative of the present Government, had expressed his and their concurrence with them. He was not able to agree with the statement that in the present Bill the recommendations of the Commission found practical adoption, except in regard to the one question of the authority; and he could not accept those clauses as in any way carrying out what was the strong recommendation of the Commission. Mr. Wood had said that these matters could be dealt with in Committee; but the members of the Council knew as well as he (Mr. Long) did how exhaustive and prolonged was the work of inquiry before a Committee in Parliament, and what an enormous expense was thrown alike upon promoters and opponents. In this connection, he was bound to consider the position of those for whose interests they must have some regard—those who were, and would be, affected by the carrying of a great measure such as that which they were considering. He was compelled to ask whether it was fair and just to cast upon them the enormous labour and expense of appearing before a Committee of the House of Commons. Parliament had quite recently taken a strong view in regard to the question of municipal water supply; and he thought it would be very wrong for the head of that Department, in considering the decision to be arrived at on this matter, to ignore, or even treat with scant attention, the claims of those who might be affected by a Bill of that kind, and who, he considered, ought not to be called upon to bear the great expense of a Committee, unless the original scheme, when it left the House for Committee, was such as to offer a reasonable chance that the outcome would be one that was generally fair. The Council might be prepared to make concessions in their Bill which would, to his mind, have materially strengthened their present position. He declined to admit that the prolonged delay, or the unsatisfactory state of the question, was the result of the policy of the present or of any previous Government. If the Council, in their wisdom, had been content to accept in the main the points laid down in the report of the Royal Commission, there would have been a better prospect for the Bill; and he deeply regretted that this had not been the course which commended itself to them. Judging from the facts of the case, he did not see any hope that the House of Commons would take a different view of the matter now from that which they had taken before; and he could not see how it would be possible for him to advise the House to pass the Bill. The policy of the Council might easily have been improved in this matter; but he had no doubt it was their desire, as it was his, that the difficulties attending the water supply of London should be got over, and the question settled in a satisfactory manner. He regretted that it was so often necessary for the Department to have to decline to do what the Council desired; but this did not proceed from any hostility towards them. He was very sorry that a *modus vivendi* had not been found between the Council and those who differed from them; but he was bound to say frankly that he did not see anything in the situation to justify him in varying the decision previously given.

Mr. TORRANCE briefly thanked Mr. Long for having received the deputation; and the members withdrew.

## NOTES FROM SCOTLAND.

### From Our Own Correspondent.

*Saturday.*

The statutory annual meeting of the Edinburgh and Leith Gas Commissioners was held on Monday, and, as usual, there was nothing of an annual nature about the proceedings. For the month of February, the report of the Engineer showed a decrease in the output of gas of about 4½ million cubic feet, but an increased output since May 16 of over 23 million cubic feet. The Works Committee reported that they had accepted tenders for plant for the Granton works as follows: Gas exhausters and engines, Messrs. R. Laidlaw and Son; condensers, Messrs. W. C. Holmes and Co.; scrubbers, Messrs. W. C. Holmes and Co.; station meters (two), Messrs. R. Laidlaw and Son; purifier plant, the Barrowfield Iron-Works, Limited; and boilers, the Stirling Boiler Company, Limited. The Commissioners, at the meeting on Monday, accepted the tender of Messrs. Redpath, Brown, and Co., Limited, of Edinburgh, to furnish the ironwork of the purifier-house at Granton, at the price of £21,055. It was reported that the Board of Trade had sanctioned the erection of a passenger railway station within the Granton works, which would be a great convenience. The Works Committee were empowered to consider whether they should purchase or hire railway waggons. Lord Provost Steel said that the Wages Board Bill contained some provisions which might affect their workmen; and, on his suggestion, the Works Committee were requested to report upon the measure.

The Commissioners have been making inquiries regarding a further loan; and yesterday they agreed with the Treasurer's Committee of the Edinburgh Town Council to borrow £200,000, at 3¼ per cent., repayable in forty years.

On Tuesday, the Coatbridge Gas Company held a festive ceremony in connection with the inauguration of new plant at their works. The principal addition is a gasholder, of 760,000 cubic feet capacity, which has been erected by Messrs. R. & J. Dempster, Limited, in a tank constructed by Messrs. Shanks and M'Ewan. Mr. Thomas Wilson, the Engineer to the Company, explained that the new holder was on the Gadd and Mason principle. It is 32 feet in diameter and has two lifts each of which is 30 feet high; the tank being 30 feet deep. The other new plant consists of two sets of exhausters and engines, with a

## GAS AND WATER COMPANIES' STOCK AND SHARE LIST.

Referred to on p. 810.

| Issue. | Share. | When ex-Dividend. | Dividend or Dividend & Bonus. | NAME. | Closing Prices. | Rise or Fall in Wk. | Yield upon Investment. |
|---|---|---|---|---|---|---|---|
| £ | | | p.c. | GAS COMPANIES. | | | £ s. d. |
| 590,000 | 10 | Oct. 12 | 10½ | Alliance & Dublin 10 p.c. | 19½—20½ | .. | 5 5 0 |
| 100,000 | 10 | ,, | 7½ | Do. 7 p.c. | 13½—14½ | .. | 5 3 5 |
| 300,000 | 100 | Jan. 2 | 5 | Australian 5 p.c. Deb. | 99—101 | .. | 4 19 0 |
| 200,000 | 5 | Nov. 14 | 6 | Bombay, Ltd. | 6—6½ | .. | 4 12 4 |
| 40,000 | 5 | ,, | 6 | Do. New, £4 paid | 4¼—4¾ | .. | 5 6 8 |
| 380,000 | Stk. | Feb. 14 | 12 | Brentford Consolidated | 258—263 | .. | 4 11 3 |
| 270,000 | ,, | ,, | 9 | Do. New | 185—190 | .. | 4 14 9 |
| 50,000 | ,, | ,, | 5 | Do. 5 p.c. Pref. | 128—132 | .. | 3 15 9 |
| 159,375 | ,, | Dec. 13 | 4 | Do. 4 p.c. Deb. | 113—116 | .. | 3 9 0 |
| 220,000 | Stk. | Mar. 14 | 10 | Brighton & Hove Orig. | 222—227* | .. | 4 8 1 |
| 226,320 | ,, | ,, | 7 | Do. A. Ord. Stk. | 158—163* | +1 | 4 5 11 |
| 1,022,500 | Stk. | Feb. 27 | 5 | Bristol, 5 p.c. max. | 121—123 | .. | 4 1 4 |
| 420,000 | 20 | Sept. 28 | 10 | British | 40—42 | .. | 4 15 3 |
| 50,000 | 10 | Feb. 28 | 12 | Bromley, Ord. 10 p.c. | 24—26 | .. | 4 12 4 |
| 79,000 | 10 | ,, | 9 | Do. 7 p.c. | 19—21 | .. | 4 5 8 |
| 500,000 | 10 | Oct. 12 | 6 | Buenos Ayres (New) Ltd. | 8½—9 | +¼ | 6 13 4 |
| 220,000 | Stk. | Dec. 28 | 4 | Do. 4 p.c. Deb. | 97—100 | .. | 4 0 0 |
| 150,000 | 20 | Mar. 14 | 8¼ | Cagliari, Ltd. | 22—24* | .. | 6 17 6 |
| 100,000 | 10 | Sept. 28 | 8 | Cape Town & Dis., Ltd. | 14—15 | .. | 5 6 8 |
| 50,000 | 50 | Nov. 2 | 6 | Do. 6 p.c. 1st Mort. | 53—55 | .. | 5 9 1 |
| 550,000 | Stk. | Oct. 12 | 12¾ | Commercial Old Stock | 278—283 | .. | 4 10 1 |
| 236,425 | ,, | ,, | 9¼ | Do. New do. | 210—215 | .. | 4 10 8 |
| 238,237 | ,, | Dec. 13 | 4½ | Do. 4½ p.c. Deb. | 132—137 | .. | 3 5 8 |
| 800,000 | Stk. | Dec. 13 | 9 | Continental Union, Ltd. | 165—170 | +2 | 5 5 11 |
| 200,000 | ,, | ,, | 7 | Do. 7 p.c. Pref. | 163—168 | .. | 4 3 4 |
| 575,000 | Stk. | Feb. 28 | 5 | Crystal Palace Ord. 5 p.c. | 115—120 | .. | 4 2 0 |
| 60,000 | ,, | ,, | 5 | Do. 5 p.c. Pref. | 127—132 | .. | 3 14 1 |
| 486,030 | 10 | Jan. 31 | 11 | European, Ltd. | 19½—20½ | .. | 5 7 4 |
| 334,050 | 10 | ,, | 11 | Do. £7 10s. paid | 14½—15½ | .. | 5 6 5 |
| 15,079,885 | Stk. | Feb. 14 | 4 1/16 | Gas-light and Coke | 4 p.c. Ord. | 90—93 | −4½ | 4 14 7 |
| 2,600,000 | ,, | ,, | 3½ | | 3½ p.c. max. | 83—92 | −1½ | 3 16 1 |
| 3,799,735 | ,, | ,, | 4 | | 4 p.c. Con. Pref. | 113—116 | .. | 3 9 0 |
| 4,063,425 | ,, | Dec. 13 | 3 | | 3 p.c. Con. Deb. | 93—95 | .. | 3 3 10 |
| 70,000 | 10 | Oct. 26 | 8 | Hongkong & China, Ltd. | 13½—14½ | .. | 5 10 4 |
| 3,800,000 | Stk. | Nov. 14 | 10 | Imperial Continental | 212—217 | .. | 4 13 11 |
| 473,600 | Stk. | Feb. 14 | 3½ | Do. 3½ p.c. Deb. Red. | 100—102 | .. | 3 8 8 |
| 561,000 | Stk. | Feb. 28 | 10 | Liverpool United A | 234—236 | .. | 4 4 9 |
| 678,100 | ,, | ,, | 7 | Do. do. B | 170—173 | .. | 4 0 11 |
| 306,083 | ,, | Dec. 28 | 4 | Do. do. Deb. Stk. | 120—122 | .. | 3 5 7 |
| 75,000 | 5 | Dec. 13 | 6 | Malta & Medn., Ltd. | 4½—5 | .. | 5 14 3 |
| 560,000 | 100 | Oct. 1 | 5 | Met. of 5 p.c. Deb. | 106—109 | .. | 4 11 9 |
| 250,000 | 100 | ,, | 4½ | Melbourne 4½ p.c. Deb. | 104—106 | .. | 4 4 11 |
| 541,920 | 20 | Nov. 14 | 3½ | Monte Video, Ltd. | 9½—10½ | .. | 6 13 4 |
| 717,946 | Stk. | Feb. 22 | 8½ | Newc'tle & G'tesh'd Con. | 225—227 | .. | 3 14 11 |
| 312,855 | Stk. | Dec. 28 | 3½ | Do. 3½ p.c. Deb. | 101—102 | .. | 3 8 8 |
| 150,000 | 5 | Nov. 29 | 8 | Oriental, Ltd. | 7—7½ | .. | 5 6 8 |
| 135,000 | 5 | ,, | 8 | Do. New, £4 10s. pd. | 5¾—6¼ | .. | 5 15 3 |
| 15,000 | 5 | ,, | 8 | Do. do. 1879, £1 pd. | 1¼—1⅝ | .. | 4 11 5 |
| | | | | | *Ex. div. | | |

| Issue. | Share. | When ex-Dividend. | Dividend or Dividend & Bonus. | NAME. | Closing Prices. | Rise or Fall in Wk. | Yield upon Investment. |
|---|---|---|---|---|---|---|---|
| £ | | | p.c. | GAS COMPANIES. | | | £ s. d. |
| 60,000 | 5 | Feb. 28 | 7 | Ottoman, Ltd. | 5⅜—6¼ | +½ | 5 12 0 |
| 851,070 | 10 | Oct. 12 | 7 | River Plate Ord. | 10¾—11¼ | .. | 6 4 5 |
| 250,000 | Stk. | Dec. 28 | 4 | Do. 4 p.c. Deb. | 97—99 | .. | 4 0 10 |
| 250,000 | 10 | Sept. 28 | 8 | San Paulo, Ltd. | 11—12 | .. | 6 13 4 |
| 135,000 | Stk. | Mar. 14 | 10 | Sheffield A | 235—240* | +8½ | 4 3 4 |
| 209,984 | ,, | ,, | 10 | Do. B | 232—236* | +5 | 4 4 9 |
| 523,498 | ,, | ,, | 10 | Do. C | 232—234* | +5 | 4 5 6 |
| 5,761,885 | Stk. | Feb. 14 | 5 | South Met., 4 p.c. Ord. | 125—130 | −3 | 3 16 11 |
| 1,547,965 | ,, | Jan. 16 | 3 | Do. 3 p.c. Deb. | 93—96 | .. | 3 2 6 |
| 380,940 | Stk. | Nov. 14 | 5 | Southampton Ord. | 107—112 | +2 | 4 9 3 |
| 70,825 | ,, | Jan. 16 | 4 | Do. 4 p.c. Deb. | 105—110 | .. | 3 12 9 |
| 120,000 | Stk. | Feb. 28 | 6 | Tottenham and Edmonton | A. 5 p.c. | 112—117 | .. | 5 1 8 |
| 250,520 | ,, | ,, | 4½ | | B. 3½ p.c. | 84—89 | .. | 5 0 0 |
| 80,100 | ,, | Dec. 13 | 4 | | 4 p.c. Deb. | 109—114 | .. | 3 10 2 |
| 182,380 | 10 | Jan. 16 | 5 | Tuscan, Ltd. | 8—9 | .. | 5 11 1 |
| 149,900 | 10 | Jan. 2 | 5 | Do. 5 p.c. Deb. Red. | 97—102 | .. | 4 18 0 |
| 230,000 | 5 | Feb. 28 | 9 | West Ham, 10 p.c. | 9—10 | .. | 4 10 0 |
| 147,000 | 10 | ,, | 6 | Do. 7 p.c. | 11¾—12½ | .. | 4 16 0 |
| 128,984 | Stk. | Dec. 28 | 4 | Do. 4 p.c. Deb | 108—113 | .. | 3 10 10 |
| | | | | WATER COMPANIES. | | | |
| 780,499 | Stk. | Dec. 28 | 11 | Chelsea, Ord. | 295—300 | −3 | 3 13 4 |
| 150,000 | ,, | ,, | 5 | Do. 5 p.c. Pref. | 155—160 | .. | 3 2 6 |
| 160,000 | ,, | ,, | 4½ | Do. 4½ p.c. Pref. '75 | 142—145 | .. | 3 2 1 |
| 175,785 | ,, | Sept. 28 | 4½ | Do. 4½ p.c. Deb. | 143—148 | .. | 3 0 10 |
| 1,720,560 | Stk. | Oct. 12 | 7 | East London, Ord. | 190—195 | .. | 3 11 10 |
| 654,740 | ,, | Dec. 13 | 4½ | Do. 4½ p.c. Deb. | 145—150 | .. | 3 0 0 |
| 797,687 | ,, | ,, | 3 | Do. 3 p.c. Deb. | 95—97 | .. | 3 2 6 |
| 700,000 | 50 | Dec. 13 | 8 | Grand Junction | 10 p.c. max. | 107—110 | −1 | 3 12 9 |
| 310,000 | Stk. | Sept. 28 | 4 | | 4 p.c. Deb. | 125—130 | .. | 3 1 7 |
| 708,000 | Stk. | Feb. 14 | 14 | Kent | 300—305 | .. | 4 12 5 |
| 160,000 | ,, | ,, | 7 | Do. New, 7 p.c. max. | 200—205 | .. | 3 8 4 |
| 1,042,800 | 100 | Dec. 28 | 10½ | Lambeth, 10 p.c. max. | 275—285 | −2½ | 3 13 8 |
| 406,200 | 100 | ,, | 8 | Do. 7½ p.c. max. | 208—213 | .. | 3 15 1 |
| 350,000 | Stk. | Sept. 28 | 4 | Do. 4 p.c. Deb. | 125—130 | .. | 3 1 7 |
| 500,000 | 100 | Feb. 14 | 13¾ | New River, New Shares | 408—413 | .. | 3 6 7 |
| 1,000,000 | Stk. | Jan. 31 | 4 | Do. 4 p.c. Deb. | 125—128 | −2 | 3 2 6 |
| 502,300 | Stk. | Dec. 13 | 7 | South-wark and Vauxhall | Ord. | 188—193 | .. | 3 12 6 |
| 126,500 | 100 | ,, | 7 | | 7½ p.c. max. | 175—180 | .. | 3 17 9 |
| 489,200 | Stk. | ,, | 5 | | 5 p.c. Pref. | 155—160 | .. | 3 2 6 |
| 1,019,585 | ,, | Oct. 12 | 4 | | 4 p.c. A Deb. | 125—130 | .. | 3 1 7 |
| 1,155,066 | Stk. | Dec. 13 | 10 | West Middlesex | 270—280 | −5½ | 3 11 5 |
| 200,000 | ,, | ,, | 4½ | Do. 4½ p.c. Deb. | 140—145 | .. | 3 2 1 |
| 200,000 | ,, | Mar. 14 | 3 | Do. 3 p.c. Deb. | 96—98* | .. | 3 1 3 |
| | | | | | *Ex. div. | | |

capacity of 80,000 cubic feet each per hour; a Holmes revolving scrubber-washer, capable of dealing with 1½ million cubic feet of gas per day; a new station meter of 80,000 cubic feet per hour capacity, and a new 24-inch Foulis governor; a patent Maxim oil carburetter, for enriching gas; and two new Lancashire boilers, 30 feet by 8 feet. The condensing plant, he said, had been doubled, and a Livesey tar-extractor, capable of dealing with 1½ million cubic feet of gas per day provided. The retort-benches have been reconstructed on the most modern principle, the number being increased from 140 to 192. A new 24-inch main has also been led into the town to replace the existing 15-inch one. The cost of these works will be about £22,000. Mr. James Johnstone, the Chairman of the Company, turned on the gas by means of a gold key which was presented to him by the Contractors. At a banquet which followed, Mr. W. Ballantyne, the Convener of the Works Committee, in proposing the toast of "The Contractors," said that these were as follows: Holder, condenser, tar-extractor, and retort-bench ironwork, Messrs. R. & J. Dempster; exhausters, Messrs. Geo. Waller and Co., Stroud; scrubber-washer, Messrs. W. C. Holmes and Co.; station meter and governor, Messrs. James Milne and Son; boilers, Messrs. J. Marshall and Co. When he said that the sale of gas in the year 1900 exceeded that of 1899 by 12 per cent., they would see that the project was fully justified. The gasholder was expected to be finished before the consumption reached its maximum in November last; but, largely owing to the very bad weather, this forecast was not attained, which fact caused very much anxiety to those responsible for the lighting of the district. Any of their customers who had reason for complaint might take it from him that everything was done for them that was possible in the circumstances, as at times the town was within half-an-hour of darkness. Mr. R. Dempster returned thanks. Mr. Wilson, the Engineer, acknowledging the toast of his own health, said that in the year 1877, when the old and the new Gas Companies were incorporated by Act of Parliament, and the works were removed from the original site beyond the Whitelaw Fountain, where they first came into operation in the year 1845, the capital amounted to the rather insignificant sum of £12,650. On the completion of the new works, it had been increased by the sum of £32,000; and on the average it had taken about £600 per annum to provide the necessary extensions of main pipes, extra meters, and cooking and heating apparatus required. When they had added the proportion chargeable to capital of the cost of the present scheme of alterations and extensions, which would amount in the aggregate to about £22,000, they would have reached to within £1000 of their present authorized share and loan capital, which amounted to the considerable sum of £79,650. The revenue and output of gas had kept pace with the increasing capital at a very satisfactory rate. In the year 1877, the revenue only came to £9000; while in 1900 the amount was £25,000. The charge for gas before the removal to Burnbank varied from 4s. 2d. to 6s. 3d. per 1000 cubic feet; while for a few years back it had varied from as low as 2s. 6d. to 2s. 11d. per 1000 feet. The total coal carbonized in 1877 was 6000 tons, as against 17,000 tons in 1900. The annual make of gas in 1877 was 39 million cubic feet, as against the present make of 140 millions; being an increase of 101 millions, or 259 per cent. In recent years, some twenty iron-works in the district had introduced gas and electric lighting installations of their own; and by this the Company had suffered a drop in their output to the almost enormous extent of 12 million cubic feet. So that, when this was fully taken into account, there was every reason for congratulation that the output was about 3¾ times greater than it was 25 years ago. This very satisfactory state of affairs was attributable, in the first instance, to the increased number of consumers, which in 1877 only amounted to 3700 ordinary, as against a total in 1900 of no less than 8000. This accounted for a little over one-half of the increased output; and the remainder, *plus* the consumption lost at the iron-works, was entirely due to the ever-increasing demand for gas for heating, cooking, and motive purposes. There were somewhere approaching 2000 different gas-fires, cooking-stoves, motors, and other apparatus on hire. It was gratifying to know that during the last twenty years the maximum dividends had always been paid, at the rates of 7 and 10 per cent.

Sheriff-Substitute Balfour, of Glasgow, who was Oversman in an arbitration between the Corporation of Glasgow and the Glasgow Iron and Steel Company, Limited, has issued his award this week. The Corporation, under their Act of 1899, took possession of ground belonging to the claimants, near Garngad Road, for the purpose of forming a railway to connect their new Provan gas-works with the North British Railway system. The amount claimed was £7457 9s., in addition to an annual feu-duty of £152 10s. 2d. The award is for £3463 2s. 6d., irrespective of feu-duty.

The Aberdeen Town Council, on Monday, agreed to experiment in a portion of Union Street with Kitson incandescent oil-lamps. These, it was claimed, give a light which is superior to either gas or electricity, and are much cheaper than the latter; costing ⅘d. per hour, as against 2d. Incandescent gas-lamps are to be erected in other thoroughfares.

This week the Corporation of Stirling have had before them an offer by the Gas Company to light some portions of the streets by means of incandescent gas-lamps. A Committee recommended the Corporation not to entertain this system of lighting; and the recommendation was unanimously approved of. The Corporation have spent thousands of pounds upon an electric lighting installation; and presumably they think it desirable to keep it in cotton wool, and not allow the breath of competition to blow upon it.

At their meeting on Thursday, the Arbroath Gas Corporation had under consideration the question of how the Town Councils Act, which recently came into force, affects them. The point is whether the undertaking is to be managed in future by the Gas Corporation (which is the Town Council under another name) or by the Town Council as a Council. It would seem, at first sight, as if it should not matter much which, but that is so far as the community is concerned; it is a question of moment to the Clerk. At present there is a Town Clerk, and there is a Clerk to the Gas Corporation. If the Town Council is to be the managing body, the latter will not be required—in fact, cannot be employed—and provision will have to be made for him. This might be done by making him Deputy Town Clerk, or first assistant, or in some


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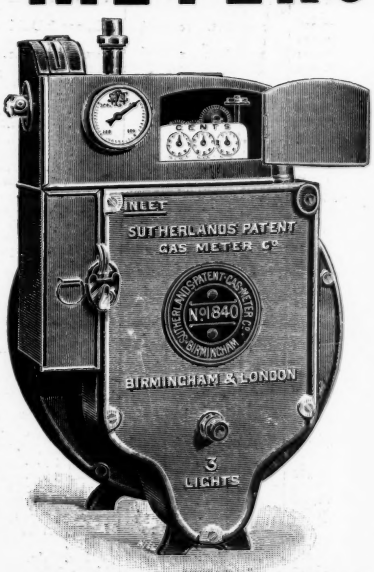



THE SUTHERLAND GAS-METER COMPANY
ESSEX WORKS, BIRMINGHAM.

such way, if the question of status were not involved. The Town Clerk is of opinion that the Town Council is to be the managing body. This is quite a natural position for him to take up; but he does not seem to have the support of the Commissioners. The method they adopted of obtaining a solution was not to put it pointedly, but to ask the advice of the Parliamentary Agents for the town as to whether the Town Councils Act changed the date of the annual balance of the books and accounts of the Gas Corporation from July 15 to May 15. The reply given was that, in the opinion of the Agents, the Burgh Gas Acts were not in any way affected by the new Act, and the Town Council would continue to administer the gas undertaking under the Gas Acts. This reply did not seem to be altogether satisfactory; and the Clerk to the Gas Corporation was instructed to apply to the Secretary for Scotland for an expression of his views as to whether the appointment of an Auditor falls to be made by the Gas Corporation or by the Town Council. Arbroath is not the only burgh where there is a clashing of interests brought about by this Act, which was passed for the removal of anomalous and cumbrous ways of working. In one case, application has been made to the Court of Session to settle the difference. Might I suggest that the Convention of Burghs is an appropriate body for the discussion of such a question? This body meets in about a fortnight, and their opinion would be obtained before that of the Court, which cannot be now secured until May. And if the Convention were unable to solve some of the difficulties which are cropping up, seeing that nearly every burgh in Scotland will be represented at it, all the difficulties could be crystallized, and something like a joint application made for judicial determination of points that are not clear—in other words, for the imposition of judge-made law.

An unfortunate occurrence has taken place at Troon, where a new gasholder is all but completed. The tank was being tested, and it is stated that in another hour the trial of it would have been over, when, early on Thursday morning, it was discovered that the water was trickling through the concrete wall. The Manager (Mr. C. P. Myers) opened the manholes, and then placed several syphons on the wall, with a view to reducing the level of the water. Mr. A. Gillespie, the Engineer, arrived in the course of the forenoon; and, after conference with the Manager, it was resolved to bring a pump into operation. By this time, the rent had widened; and the water was flowing out in a steady stream. The Engineer expressed the hope that the rent did not go farther down than the first course. At the part which gave way, there is no banking.

**Halifax Rural District Council and the Clifton Water Company.**—Mr. W. A. Ducat held a Local Government Board inquiry at Clifton, Brighouse, a few days ago, into the application of the Halifax Rural District Council for leave to borrow £6350 for the purchase of the undertaking of the Clifton Water Supply Company, Limited, who supply the villages of Clifton and Hartshead with water. It was stated that the Company obtained their water from the Halifax Corporation on advantageous terms, and that the price to be paid by the Council for the undertaking had been mutually agreed upon. There was no opposition.

## CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *March* 23.

**Sulphate of Ammonia.**—There has been more doing towards the close of the week, and some recovery from the depression of the opening days. The level of prices reached has induced more direct buying; and it has become necessary to cover outstanding contracts for March shipment. Demand for home consumption is also an increasing quantity. Supplies have, however, been ample; and the closing quotations are £10 11s. 3d. to £10 15s. per ton, delivered f.o.b. at the ports. In the forward position, makers' views are still much above spot prices. On the other hand, buyers do not seem to be getting on at their limits—indicating that speculators are chary about going "short" unless for near delivery. Hence, forward business has been very limited.

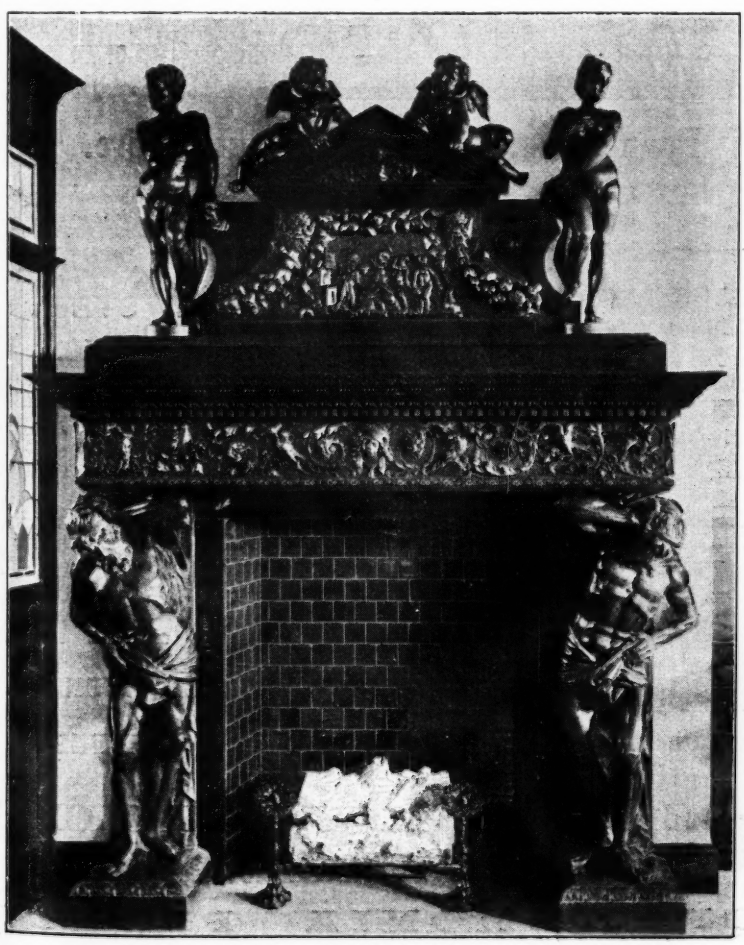
**Nitrate of Soda** is firmer on spot; the quotations being 8s. 6d. to 8s. 9d. per cwt., according to quantity.

LONDON, *March* 23.

**Tar Products.**—The markets are very quiet all round, and there is really nothing of any importance doing. Sales of 90 per cent. benzol have been made by manufacturers in the Midland district at rather low prices; but the exact figures have not transpired, as they were undoubtedly made on a basis of delivery at makers' works and naked. 50/90 per cent. is entirely neglected, and there is no demand. A small transaction is reported at 9½d.; but this also is believed to have been at makers' works, although, in this instance, casks were included. Solvent is neglected; and there is no business to report. Crude carbolic acid is also a little easier; some quantities having been placed at 2s. 6d. f.o.b. prompt shipment. Crystals remain in the same position. As regards tar oils, there is nothing new to advise. Naphthalene salts are also quiet, and the large quantities coming forward appear to have a very depressing effect on the market.

The average values obtaining during the week are: Tar, 14s. 6d. to 17s. 6d. Pitch, east coast, 31s.; west coast, 28s. 6d. Benzol, 90's, 10d. to 11d.; 50's, 9½d. to 10½d. Toluol, 1s. 1½d. to 1s. 2d. Crude naphtha, 4d. Solvent naphtha, 1s. 1½d. Heavy naphtha, 1s. to 1s. 1d. Creosote, 1d. Heavy oils, 1¾d. Carbolic acid, 60's, 2s. 6d. Naphthalene, 90s. to 95s.; salts, 58s. 6d. to 67s. 6d. Anthracene, "A quality," 3d.; "B," 2d.

**Sulphate of Ammonia.**—The market continues quiet; and there is little or no business to report. Beckton value continues to decline. Although the Gaslight and Coke Company quote £10 15s., there have been second-hand sellers at about £10 10s. As regards Liverpool, a little business is reported at £10 15s. prompt delivery. With respect to Leith, no contract of any importance has been passed lately; but the actual value may be taken as £10 15s. There is an absence of business at Hull; but the price remains unchanged. The demand for home consumption continues very good indeed; but so far as export is concerned, there is a total absence of inquiry.



Corner of **Richmond's** Bournemouth Show-Room.

Carved Venetian Overmantel and Fire . . . reproduced from the Doge's Palace.

## COAL TRADE REPORTS.

### From Our Own Correspondents.

**Lancashire Coal Trade.**—The decided downward tendency of the coal market in all descriptions of fuel except the better qualities suitable for house-fire purposes, to which reference was made last week, is amply confirmed by the course of prices in the Yorkshire and Midland districts. As previously intimated, the gas coal and locomotive fuel contracts are proving the real test of the market; and although the somewhat extraordinary statements that, during the last few days, have been emanating from several districts, as to the prices which are being actually accepted for locomotive fuel contracts in Yorkshire and the Midlands, perhaps do not altogether accurately represent the real situation, they are to a large extent corroborated by the admissions of Yorkshire and Derbyshire colliery representatives who attend the market here. There would seem to be little doubt that the railway companies will be able to place contracts for good Yorkshire hard coals at from 9s. to 9s. 6d. per ton at the pit; while Derbyshire collieries, which are becoming very keen competitors in this class of fuel, will probably be sellers at as low as 8s. 6d. to 9s. These figures would represent a drop of quite 6s. to 7s. per ton on last year's low prices; and in Lancashire it is scarcely anticipated, considering this keen competition in other quarters, that the locomotive fuel contracts will be secured at more than about 8s. 6d. to 9s. per ton at the pit, representing a drop of 4s. to 4s. 6d. on last year's prices. This great reduction in locomotive fuel must, of course, react upon other classes, and will certainly make itself felt as regards the prices which collieries will have to take in renewing their contracts for gas-making coals. The probability pointed out last week that the reduction of 2s. 6d. per ton on last year's rates, which has already been followed by Yorkshire collieries, would scarcely represent the full extent of the concessions that coalowners might eventually have to make, is now being recognized by representatives of some of the largest gas-coal raising collieries, who freely admit that they will consider themselves very lucky if they are able to secure gas coal contracts at no greater reduction than 2s. 6d. per ton on last year. In the general common round coal trade, buying still for the most part goes on from hand to mouth; consumers not caring to contract owing to the evident prospect of lower prices. About 11s. per ton at the pit remains the average quotation on current deliveries of good ordinary qualities of steam and forge coals. The engine fuel trade has undergone a most astonishing collapse; and except here and there in some of the very best qualities of slack, attempts at maintaining what may be termed the list basis rates have been practically abandoned. Ordinary and medium qualities of Lancashire slack can be bought at prices ranging from 7s. to 8s. per ton at the pit, with some of the best descriptions still quoted at 9s. to 9s. 6d.; but slack from Derbyshire, Staffordshire, and Yorkshire is offering freely at any price from 4s. upwards. The market all through is so irregular, owing to surplus lots being pushed for immediate clearance at all sorts of prices, that it is scarcely possible to get at any actually fixed quotation for open market sales. For shipment, slack is also being pushed at very low figures; and Orrell slack, from the Wigan district, is reported to have been sold, delivered at the Partington tips, as low as 7s. 3d. per ton. In the coke trade, prices continue weak. Foundry qualities, which have been reduced about 1s. 6d. per ton, to level the nominal list basis to something like the selling rates, are not quoted more than about 25s. per ton, with good washed Lancashire furnace cokes to be obtained at 12s. to 12s. 6d., and common unwashed Yorkshire cokes at from about 9s. at the ovens.

**Northern Coal Trade.**—Firmness in the steam coal trade continues, and prices are rather higher; orders that had been kept back having had to be put into the market, and necessarily stiffening it. Best Northumbrian steam coals are firm at from 11s. 9d. to 12s. per ton f.o.b.; and a Government order has been placed at the former price for forward delivery. Steam smalls are steady at from 5s. 9d. to 6s. per ton f.o.b.; the collieries having at present a fair amount of business. In the Durham coal trade, there is still an abundant supply, and any slight firmness is due to the better condition of affairs in the more northern county. Gas coals are now in rather lessened demand, and the tendency is towards dulness in price. The quotation varies rather more than is usual—from about 9s. to 10s. per ton f.o.b., according to the position of collieries in regard to contracts. Manufacturing coal is quiet; coking coal is duller; and household coals are weaker, with lower prices for the latter in prospect. In the coke trade, the price is rather firmer; best Durham coke being from 17s. to 18s. per ton f.o.b., while at the furnaces the price varies from 13s. 6d. to 14s. per ton. There is in the gas coke trade the benefit of a diminishing output; but the price is very much varied. From 12s. 6d. to 13s. 6d. per ton may be taken as the f.o.b. figure; but there are contracts running at widely different prices.

**Scotch Coal Trade.**—There was a slight rise in prices last week, owing to a better demand for export. Great expectations are being formed as to the improvement in trade which will follow the opening of the Baltic ports; and, particularly in Fifeshire, the fear is expressed that the decision of the miners to work only five days a week may drive the trade elsewhere. The prices quoted are: Main, 9s. 3d. to 9s. 6d. per ton f.o.b. Glasgow, ell 10s. to 10s. 9d., and splint 10s. 6d. to 10s. 9d. The shipments for the week amounted to 157,195 tons—an increase of 16,475 tons upon the previous week, but a decrease of 44,519 tons as compared with the corresponding week of last year. For the year to date, the total shipments have been 1,637,535 tons—a decrease of 341,493 tons upon the same period of last year.

**New Reservoir at Bacup.**—Last Wednesday, the ceremony took place of cutting the first turf and laying the first stone of the new reservoir of the Bacup Corporation at Cowpe, which will cost £140,000. The turf was cut by Alderman Shepherd, and the first stone laid by the Mayor (Alderman Maden). Mr. James Diggle, Assoc.M.Inst.C.E., Engineer of the Heywood and Middleton Water Board, is the Engineer, and Mr. T. Taylor, of Rochdale, the Contractor.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**Driffield Gas-Works.**—The "Hull News" says: The Driffield District Council are "hoping soon to extend their gas-works by an outlay of nearly £6000 on a new gasholder, &c. Evidence crops up almost daily of the dear bargain the Council made when the works were purchased three years since. The works have been practically gutted since then, and new engines, a new system of retorts, new mains, and a new holder were wanted. Poor ratepayers!"

**Dartford and the London Water Question.**—At the last meeting of the Dartford Urban District Council, Mr. Lawrence Mitchell brought up the question of the town endeavouring to get control again of its water supply, in connection with the proposals of the London County Council. He said that until thirty years ago the town had its own water undertaking; but, by a long lamented decision, it was sold to the Kent Water Company. His suggestion was that if the Council's Water Bill came before a Parliamentary Committee, the town should be represented with the view of the local supply being in the hands of the Urban and Rural Authorities. The Clerk (Mr. J. C. Hayward) expressed his doubt whether the Government would allow the Bill to pass; but Mr. Mitchell gave notice of a motion to consider the appointment of a Joint Committee with the Rural District Council upon the subject.

**Torquay Gas Company.**—The annual meeting of this Company was held last Thursday—Mr. W. H. Kitson presiding. In their report, the Directors stated that the total receipts on revenue account for the past year amounted to £31,563, and the expenditure to £24,191; leaving a balance of £7372 to be carried to profit and loss account. They recommended that full dividends should be paid. In spite of the heavy price of coal, which necessitated an increase in the charge for gas, the consumption had attained the highest point yet recorded. A considerable addition had been made to the prepayment meters in use, and a large number of stoves and gas-fires had been sent out; but the public did not seem to fully appreciate the advantages to be obtained by using them, instead of coal-fires, especially in the summer months. Looking at the probability of a further fall in the price of coal at no distant date, the Directors were pleased to suggest that the charge for gas should be reduced to 3s. 3d. per 1000 cubic feet for the quarter commencing on Lady-day. The Chairman, in moving the adoption of the report and the payment of the usual dividends, congratulated the shareholders on the fact that, in spite of the opposition of the electric light and the increase in the price of coal, the Company had had a record year. They paid more per ton for coal than in any year since 1886; and owing to this increase, they were compelled to raise the price of gas from 3s. to 3s. 6d. per 1000 cubic feet. Not a single complaint, however, was made to them officially of the higher charge; and only one consumer discontinued using gas because of it. They took the earliest opportunity of reducing the price to 3s. 3d., with the prospect of further early reductions. The prepayment meters yielded nearly £2000 last year; the receipts from this source having increased by £500 a year since the system was introduced four years ago. The report was adopted.

**New Pumping Plant for Chichester.**—Additional pumping plant has been laid down at the Old Fishbourne water-works of the Chichester Corporation; and it was formally brought into service by the Mayor (Mr. R. Combe Miller) last Thursday. The new engine is capable of delivering upwards of a million gallons per twenty-four hours. The total cost of the additions has been about £4500.

**Sales of Shares.**—A small number of £10 shares in the Horncastle Water Company were disposed of a few days since at £16 10s. and £16 15s. each. On the 16th inst., Messrs. Cunnah and Roberts sold at the Blossoms Hotel, Chester, £75 of 10 per cent. consolidated ordinary "A" stock of the Chester United Gas Company for £165.

**Stockton's Gas Profits.**—The total income derived from the Stockton Gas-Works for the past financial year was £75,343, against £63,718 for the previous year, or £11,625 more. The main heads of increase are £9309 for gas charges, and £2745 on the sale of coke. On the other hand, the expenditure was £71,494—an increase of £12,387; and the net profit available for the reduction of the rates is £3849, against £4610 in 1899-1900. The great item in the additional expenditure is the high price of coal, labour, &c.; there being a rise in this respect of £7351, or equal to a rate of 10d. in the pound. If the present high price of coal continues, which is extremely unlikely—the market already showing a downward tendency—the Gas Committee estimate that, at the present price charged for gas, the profits for the year ending March, 1902, will be £3000.

**Wrexham Gas Company.**—At the recent ordinary general meeting of this Company, under the presidency of Mr. J. Oswell Bury, the Directors reported that the sale of gas in the twelve months ending Dec. 31 produced £12,801, compared with £12,026 in 1899. More than 1500 prepayment meters were now in use; and the number of cookers on hire had largely increased. The 50 per cent. advance in the price of coal only affected the working in the latter half of the year; and the Directors were able to meet the additional expenditure without raising the charge for gas. They recommended dividends of 5 and 3½ per cent. on the consolidated stock and shares, making with the interim dividends 10 and 7 per cent. per annum respectively. In moving the adoption of the report, the Chairman referred to the gratifying fact that the Company stood among the few who had been able to pilot their business through the recent coal crisis without raising their price. The make of gas in the past year was upwards of 100 million cubic feet, so that with the ending of the century the Company also completed their century of millions. As showing the extraordinary growth of the business, he mentioned that thirteen years ago the annual make was under 50 millions. It was satisfactory to note that the unaccounted-for gas had decreased from 11·5 per cent. in 1899 to 8·4 per cent. in the past year. He referred to the anxious and arduous task their Manager (Mr. Joseph Braithwaite) had had to carry on the concern through the winter; and he said it was impossible to speak too highly of his devotion to duty, or of the results achieved by his excellent management. The entire staff had, in fact, done their work admirably. The motion was carried unanimously.


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| SALTLEY, BIRMINGHAM (Second Contract) | 2,000,000 |
| WINDSOR ST., BIRMINGHAM (Second Cont.) | 2,000,000 |
| HALIFAX | 1,000,000 |
| TORONTO | 250,000 |
| OTTAWA | 250,000 |
| LINDSAY (Remodelled) | 125,000 |
| MONTREAL | 500,000 |
| TORONTO (Second Contract; Remodelled) | 2,000,000 |
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| OTTAWA (Second Contract) | 250,000 |
| BRANTFORD (Remodelled) | 200,000 |
| ST. CATHERINES (Remodelled) | 250,000 |
| KINGSTON, PA. | 125,000 |
| PETERBOROUGH, ONT. | 250,000 |
| WILKESBARRE, PA. | 750,000 |
| ST. CATHERINES (Second Contract) | 250,000 |
| BUFFALO, N.Y. | 2,000,000 |
| WINNIPEG, MAN. | 500,000 |
| COLCHESTER (Second Contract) | 300,000 |
| YORK | 750,000 |
| ROCHESTER | 500,000 |
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| CRYSTAL PALACE DISTRICT | 2,000,000 |
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**The Price of Gas at Hastings.**—The reduction of 4d. per 1000 cubic feet which will take effect from the 1st prox. at Hastings will bring the price down to 3s., not to 3s. 4d., as was inadvertently stated last week (p. 765). The figures were correctly given in the "JOURNAL" for the 12th inst. (p. 711).

**Mutual Water, Gas, and Electricity Company.**—According to the accounts presented at the recent annual general meeting of this Company, the transactions in the year ending Nov. 30, 1900, amounted to 6,996,031 frs.; and the profit and loss account showed a deficit of 159,701 frs., due exclusively to the reduced value of bills, owing to the disturbed condition of the Brussels Bourse. The Company have an interest in the Electricity and Hydraulic Company of Charleroi, the business of which flourished last year; also in the St. Petersburg Electric Lighting Company, the receipts of which amounted last year to 2,115,387 frs., against 1,308,773 frs. in 1899 and 693,804 frs. in 1898. Another undertaking in which the Mutual Company are interested is the Chausenburg Lighting Company. The operations of this Company extend to Oldenburg; and the working results were much the same as before, notwithstanding the rise in the price of coals and a falling off in the sale of gas.

**Reduced Price of Gas for Heating Purposes at Smethwick.**—At the last monthly meeting of the Smethwick Town Council, the Gas Committee reported that they had received a request from a large consumer that gas used for heating and manufacturing purposes might be charged at the same rate as that employed for motive power. They recommended that it should be complied with, and that the price to all consumers of gas for heating purposes should be accordingly reduced to 2s. 4d. per 1000 cubic feet. Mr. Woodcock referred to the penny-in-the-slot meters, and asked if the system worked well in Smethwick, and if, after the cost of fittings and other expenses had been incurred, a profit was made. Mr. Stones said the slot meters did very well indeed. They had a great demand for them, and could hardly cope with the requirements. He explained, with regard to the use of gas for heating purposes, that they had had an application from one of the largest consumers who was supplied with 10 million cubic feet per annum for heating purposes, and who now proposed to extend this system very greatly. There was no doubt that gas at that price for heating purposes was profitable, from the fact that it was only required during the daytime. The report was adopted.

**Armagh Gas Company, Limited.**—At the annual meeting of this Company on Monday last week, the Directors reported that the net balance available for distribution amounted to £1059, which was only about £10 short of the sum required to pay the usual 2s. per share, free of income-tax; and they recommended that this should be drawn from the reserve. In moving the adoption of the report, the Chairman (Mr. W. J. Best) congratulated the shareholders on the fact that they were about to receive the usual dividend of 10 per cent. Considering the enormous advance of 40 per cent. in the price of coals, he thought he might also congratulate the consumers that the increase in the price of gas had only been 10 per cent. This was mainly due to the excellent management of Mr. James Whimster, and the deep interest taken by the Directors in the conduct of the concern. The report was unanimously adopted. The services of the Directors having been acknowledged, a vote of thanks was accorded to Mr. Whimster for the very successful way in which he managed the Company's affairs. In his report, he stated that, owing to sewerage works, there had been an accident to one of the mains, which had resulted in the loss of about 16,000 cubic feet of gas, for which, and the cost of repair, the contractor will be charged.

From the accounts of the Dewsbury and Heckmondwike Water Board, it appears that the surplus revenue amounts to £5000. Of this sum, £3750 goes to Dewsbury, and the rest to Heckmondwike.

Last Thursday, the Leominster Gas and Coke Company, Limited, were fined £1 for using unjust scales. The Inspector of Weights and Measures who preferred the charge, said no allegation of dishonesty was made.

The Gas and Lighting Committee of the Bolton Corporation have accepted the tender of Messrs. Clayton, Son, and Co., Limited, for the supply and erection of a three-lift holder to replace the two-lift holder at Spa Fields.

The Corporation of Glasgow have accepted the tender of Sir William Arrol and Co., Limited, for the iron and steel work, girders, &c., required in the construction of the retort-house and coal-store at the new gas-works at Provan. The amount of the tender is £33,969.

The Leeds Fireclay Company have been entrusted with repeat orders for their regenerator settings and ironwork at the Birstall and Walton-on-Thames Gas-Works. They have also received orders for regenerator settings for Hampton Court and Melbourne (Derbyshire) Gas-Works.

An acetylene automobile is causing talk in France. The usual gasoline reservoir is replaced by an acetylene generator; and the motor covers 70 miles at a speed of eight to ten miles an hour. The motor developes eight to ten horse power, and, if necessary, it can (it is said) also work with gasoline.

The Otley Gas Company have placed a repeat order with Messrs. R. Dempster and Sons, Limited, of Elland, for three settings of eight retorts, with Chester's furnaces. The same firm have also received a repeat order from the Great Western Railway Company at Swindon, for eight settings of retorts on the same system.

Believing it to be a waste of time to discuss any proposal for obtaining water nearer home, the Margate Corporation have decided to endeavour to reverse the verdict of the recent poll of the borough on the subject of the Wingham scheme. As a first step, they have already resolved to promote the necessary Bill for the purpose in the next session of Parliament.

Sergeant J. Morley and Private J. Pogson, two of the Volunteers who are leaving for South Africa, were a few days ago each presented with a sum of money subscribed by their fellow-workmen at the Carlisle Gas and Water Works. The Engineer and Manager (Mr. C. B. Newton), who made the presentation, assured the men of the good wishes of the workmen, and expressed the hope that they might be favoured by fortune both in health and in any action they might be called upon to take part in. The gifts were suitably acknowledged by the recipients.

Under the auspices of the Newmarket Gas Company, an exhibition of gas lighting and cooking appliances was opened in the Town Hall last Tuesday. The stoves were supplied by Messrs. Fletcher, Russell, and Co., Limited, and John Wright and Eagle Range, Limited; and demonstrations were given with them alternately by Mrs. A. M. Collins. Among the Gas Company's exhibits were several incandescent burners of a new type. The inaugural ceremony was performed by the Chairman (Mr. R. Stephenson); and the exhibition remained open till Friday.

In a trading enterprise which stretches its arms throughout the country, and requires both in the pursuit of development and for the maintenance of prosperity a number of district representatives, it is a wise thing to keep those agents informed as to what is being done at headquarters, at the various works, and in their fellow workers' areas. Knowledge from the centres of the business must be of great assistance; and news of the successes and endeavours made in other districts cannot fail to induce a desire to be at the top of the tree, and the desire produces the necessary effort. The other day we saw the first number of a "Monthly Record" which the Richmond Gas Stove and Meter Company, Limited, have commenced to privately circulate among their staff, and which has for its objects the dissemination of such information as has been referred to. The idea commends itself as a good one. The front page of the first number contains an address to the staff from the head of the firm; and in the succeeding pages several matters of interest connected with the business are dealt with. The London advertising department is, we believe, responsible for the "editorial" work connected with the "record."

An inaugural dinner of the firm recently reconstructed under the title of Messrs. George Glover and Co., Limited, was held on the evening of the 12th inst. at the Chelsea Town Hall. Mr. George Glover was in the chair, Mr. J. W. Glover occupied the vice-chair, and about 170 of the employees were present. Among the gentlemen supporting the Chairman was Mr. E. W. T. Richmond, the new member of the firm, who was asked by him to propose the toast of the evening—"Success to George Glover and Co., Limited." In doing so, he gave a brief history of his own Company, and said he had so much confidence in Mr. Glover that he had asked him to be Vice-Chairman of it. He should do all he possibly could to make the firm of George Glover and Co., Limited, the best in the country. The Chairman having responded, Mr. Taylor, on behalf of the men, asked him to accept for his brother, Mr. Thomson Glover, on his retirement, a silver tea and coffee service, subscribed for by every man in the shop and all branches of the establishment. The Chairman briefly acknowledged the gift. In the course of the proceedings, which were of a very harmonious character, the Vice-Chairman expressed the hope that a profit-sharing scheme would come into operation during the next twelve months.


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[For Illustrated Advertisement, see March 5, p. 647.]

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State full Particulars and amount of Capital that could be introduced, to No. 3663, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

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State Age, Experience, and Salary required, to W. J. JENKINS AND CO., LIMITED, Gas Engineers, RETFORD.

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**THE Ballymena and Harryville Gas**light Company, Limited, invite TENDERS for 2500 Tons of best screened GAS COAL, free on Waggons at Larne Harbour, to be delivered before the 1st of November next.
Payment to be made on the first Thursday in March, 1902.
Tenders to be sent to Mr. Samuel Hood, Mill Street, Ballymena, on or before the 30th of March, 1901.

**THE Bridgewater Trustees are prepared** to receive TENDERS for the TAR produced at their Coke-Works, for a period of Twelve Months from the 1st of July next, delivered into Contractor's Tanks at the Trustees' Brackley Siding on the Little Hulton Mineral Branch of the L. & N.W. Railway, or their Wharton Hall Siding on the Pendleton and Hindley Branch of the L. & Y. Railway.
Tenders, endorsed "Tender for Tar," to be addressed to the Bridgewater Trustees, 4, Chapel Walks, Manchester, and to be delivered on or before the 11th of April next.

**ROTHERHAM CORPORATION.**
**(GAS DEPARTMENT.)**

**THE Gas Committee of the above Cor**poration are prepared to received TENDERS for the supply and delivery of FIRE-CLAY, RETORTS, BRICKS, &c.
Forms of Tender may be obtained upon application to Mr. Frank A. Winstanley, Gas Engineer.
Tenders, endorsed "Fire Goods," to be delivered to the undersigned not later than April 10 next.
H. HAMPTON COPNALL,
Town Clerk.

TENDERS FOR TAR.

**THE Directors of the Derby Gaslight** and Coke Company are prepared to receive TENDERS for the purchase of the surplus TAR they will have for disposal during the Twelve Months ending March 31, 1902—namely, about 2900 Tons.
Further Particulars may be obtained on application at the Company's Offices, Friar Gate, Derby.
Tenders must be addressed to the Chairman of the Finance Committee of the Derby Gaslight and Coke Company, Friar Gate, Derby, endorsed "Tender for Tar," and delivered on or before Friday, March 29, 1901.
By order,
H. BULLIVANT, Secretary.
March 16, 1901.

**BROADSTAIRS GAS COMPANY.**

**THE Directors of the above-named Com**pany invite TENDERS for the supply of 5500 Tons of good screened GAS COAL per annum (for One, Two, or Three Years), delivered at Broadstairs Station, or into Carts at Broadstairs Harbour, in such quantities as the Manager may require from time to time.
Tenders to be sent in not later than Monday, April 1, 1901, addressed to the Chairman of the Company.
The Directors do not bind themselves to accept the lowest or any Tender.
Full Particulars can be obtained on application to the undersigned.
F. HIGGINSON,
Engineer, Manager, and Secretary.
Gas Office: Alexandra Road,
Broadstairs, March 23, 1901.

**EAST RETFORD CORPORATION GAS-WORKS.**

GASHOLDER TANK.

**THE Gas Committee are prepared to** receive TENDERS for the Work and Materials required in the Excavating and Building of a BRICK and PUDDLE GASHOLDER TANK, 87 feet diameter, and 20 feet deep.
The Specifications and Drawings may be seen on application to the undersigned on payment of Two Guineas, which will be returned on receipt of a *bonâ-fide* Tender.
Sealed Tenders, endorsed "Contract No. 1 Tank," to be addressed to the Chairman of the Gas Committee, Retford, not later than the 30th day of March, 1901.
The Committee do not bind themselves to accept the lowest or any Tender.
J. B. FENWICK,
Gas and Water Engineer.
Retford, March 12, 1901.

**EAST RETFORD CORPORATION GAS-WORKS.**

GASHOLDER.

**THE Gas Committee are prepared to** receive TENDERS for the Work and Materials required in the Construction and Erection of a TELESCOPIC GASHOLDER, with Outer Lift 85 feet diameter, and 20 feet deep.
The Specification and Drawings may be seen on application to the undersigned on payment of Two Guineas, which will be returned on receipt of a *bonâ-fide* Tender.
Sealed Tenders, endorsed "Contract No. 2 Gasholder," to be addressed to the Chairman of the Gas Committee, Retford, not later than March 30, 1901.
The Committee do not bind themselves to accept the lowest or any Tender.
J. B. FENWICK,
Gas and Water Engineer.
Retford, March 12, 1901.

**LONGTON CORPORATION GAS-WORKS.**

FOR SALE.

**THE Corporation of Longton have for** DISPOSAL:—
Two CORNISH BOILERS, by Danks of Dudley, each 17 ft. long by 5 ft. diameter; Size of Tube, 2 ft. 6 in.
The Boilers are in good condition, and are fitted with best Gun-Metal Mounts and Gauges. They have been working at a pressure of 60 lbs. per square inch.
Also New FIRE-CLAY RETORTS—
38 lengths 16 in. Round Retorts, 6 ft. 8 in. long, Mouthpiece Ends.
16 lengths 16 in. Round Retorts, 6 ft. 8 in. long, Middle Pieces.
15 lengths 16 in. Round Retorts, 10 ft. long, Mouthpieces.
7 lengths 22 in. by 16 in. Oval Retorts, 6 ft. 8 in. long, Mouthpieces.
4 lengths 22 in. by 16 in. Oval Retorts, 6 ft. 8 in. long, Middle Pieces.
Cast-Iron MOUTHPIECES, ASCENSION and DIP PIPES, for four through Beds of Sevens. Wrought-Iron HYDRAULIC MAINS for five through Beds of Sevens.
Applications to view, and Offers for same, may be arranged by applying to
W. LANGFORD,
Engineer and Manager.
Gas-Works
Longton, Staffs.

**URBAN DISTRICT COUNCIL OF HINDLEY.**

**THE Gas Committee are prepared to** receive TENDERS for the supply and erection of Six new PURIFIERS, 20 ft. square, and One LIVESEY WASHER; also for ALTERATION to SCRUBBER.

Further Particulars may be obtained on application to the Manager, Gas-Works, Hindley.

Tenders, endorsed "Purifiers, &c.," to be delivered to the undersigned not later than April 15, 1901.

The Committee do not bind themselves to accept the lowest or any Tender.

By order,
STEPHEN HOLT,
Clerk.

Gas-Works, Hindley,
March 22, 1901.

**ISSUE OF SHARES.**

**BOURNEMOUTH GAS AND WATER COMPANY.**

SALE BY TENDER OF 1000 "B" SHARES,
IN PURSUANCE OF THE PROVISIONS OF THE BOURNEMOUTH GAS AND WATER ACT, 1896.

**NOTICE is Hereby Given, that it is the** intention of the Directors of this Company to SELL BY TENDER 1000 "B" SHARES of £10 each (the Dividend on which is limited to 7 per cent.) to be paid up in full on or before the 30th of June, 1901.

Particulars and Conditions of Tender may be obtained at the Company's Offices, Bournemouth, or of the Secretary as under.

Sealed Tenders must be sent to the Secretary not later than Eleven o'clock on Friday morning, the 12th of April, 1901.

By order,
WILLIAM CASH,
Secretary.

London: 90, Cannon Street, E.C.,
March, 1901.

**SALES BY AUCTION OF GAS AND WATER STOCKS AND SHARES.**

**MR. ALFRED RICHARDS** begs to notify that his AUCTIONS of STOCKS and SHARES in London, Suburban, and Provincial Gas and Water Companies are held PERIODICALLY, at the Mart, Tokenhouse Yard, E.C.

He also undertakes the issuing by AUCTION of GAS and WATER STOCKS and SHARES under Parliamentary Powers.

Terms for issuing such Capital, and also for including Gas and Water Stocks and Shares in these periodical Sales, can be obtained on application at Mr. ALFRED RICHARDS' OFFICES, 18, FINSBURY CIRCUS, E.C.

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of the

**METROPOLITAN GAS COMPANIES.**

BY

**LAURENCE W. S. ROSTRON,**

M.A., B.C.L.

LONDON:

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## HEBBURN MAIN GAS COALS.

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| Yield of Gas per Ton . . | 10,500 Cubic Feet. |
| Illuminating Power . . . | 16·4 Candles. |
| Coke . . . . . | 68 per Cent. |

**For Prices, f.o.b. Ship or Delivered by Rail, apply to**

**The Wallsend & Hebburn Coal Company, Ltd.**

**8 Lombard Street,**
**NEWCASTLE-ON-TYNE.**

**W. RICHARDSON, Fitter.**

## HYDRAULIC BLOWER

**For blowing Air into Gas Purifiers for the purpose of**

## REVIVIFYING THE FOULED OXIDE.

Full Particulars on application.

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## HEATHCOTE GAS COAL.

**Rich in Illuminating Power and Yield of Gas.**

**Above the Average in Weight and Quality of Coke.**

**Maintains a High Standard in Residuals.**

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**NITRATE of Thorium and Cerium.**
FABRIK CHEMISCHER PRAEPARATE VON STHAMER, NOACK, AND CO., HAMBURG.

**TO GAS AND GENERAL ENGINEERS.**

GUARANTEED AND UP TO DATE
BUY DIRECT FROM THE MAKER
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LADIES & GENTS
LISTS FREE
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**Highest Results in Gas, & Excellent Coke.**

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**Head Office: Miles Platting, MANCHESTER.**

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Manufacture and keep in Stock at their Works (also large stock in London)

PIPES and CONNECTIONS, 1½ to 48 inches in diameter, and make and erect to order RETORTS, PURIFIERS and TANKS, with or without planed joints, COLUMNS, GIRDERS, SPECIAL CASTINGS, &c., required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

NOTE.—Makers of HORSLEY'S PATENT SYPHONS. These are cast in one piece, without Chaplets; doing away with Bolts, Nuts and Covers, and rendering Leakage impossible.

## BOLDON GAS COALS.

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| Yield of Gas per Ton. . | 10,500 Cubic Feet |
| Illuminating Power . . | 16·9 Candles. |
| Coke . . . . . | 66·7 Coke. |
| Sulphur . . . . . | 0·86 Sulphur. |
| Ash . . . . . | 2·04 Ash. |

**As per Analysis by**
**Mr. JOHN PATTINSON, F.I.C., F.C.S.**

**For Prices, &c., apply to**

**W. H. PARKINSON,**

**THE HARTON COAL CO., LTD.,**

**NEWCASTLE-ON-TYNE.**

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**Manufacturers of GAS-RETORTS, GLASSHOUSE FURNACE & BLAST-FURNACE BRICKS, LUMPS, TILES, and every description of FIRE-BRICKS.**

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effects a great saving of time, labour, and expense.

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*Prices are Reduced.*

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**SHEAF WORKS, SHEFFIELD,**

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**STEEL OF ALL DESCRIPTIONS.**

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**FOR**

## GAS PURIFICATION,

**For use in the**

**RECOVERY OF SULPHUR,**

**ALSO**

**Removal of last Traces of SULPHURETTED HYDROGEN in catch position.**

**Full Particulars on application to the Patentees:**

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## THORNLEY GAS COALS

**WORKED BY THE**

**WEARDALE IRON & COAL CO., LD.**

**OUT OF THEIR**

**THORNLEY AND WHEATLEY HILL COLLIERIES.**

**Analysis made by**
**Messrs. J. & H. S. PATTINSON.**

| | |
|---|---|
| Yield of Gas per Ton . . | 10,500 Cub. Ft. |
| Illuminating Power . . . | 16·9 Candles. |
| Coke (of good quality) . . | 67·5 per Cent. |
| Sulphur . . . . . | 0·58 " |
| Ash . . . . . | 2·73 " |

**For Price, &c., apply to the**

**WEARDALE IRON & COAL CO., LD.**

**QUAYSIDE, NEWCASTLE-ON-TYNE.**

**UNEQUALLED.**

Gas Companies are solicited to try Samples of the

**MIRFIELD**

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*Prices and Analysis on application.*

MIRFIELD (GAS-COAL) COLLIERY COMPY.

RAVENSTHORPE, NEAR DEWSBURY.

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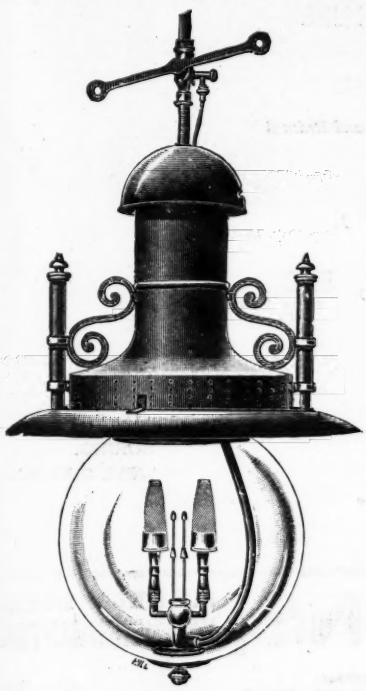
THE PATENT

**"BEACON" GLOBE LAMP.**



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**HOLMSIDE**

**GAS COALS.**

**Present Daily Produce over 3000 Tons.**

*Latest Analysis—By CHARLES PHILLIPS, Gas Examiner to Rotherham Corporation*

Yield of Gas per Ton . . . 11,205 Cubic Feet.
Illuminating Power 16 7/10 Stand. Sperm Candl.
Coke (of good & pure quality) 13¾ Cwt. per Ton.
Sulphur . . . . . A little over 1 per Cent.
Ash . . . . . Under 1 per Cent.
Tar . . . . . 163 lbs. (Avoir.) per Ton.
Ammoniacal Liquor 103 lbs. (Avoir.) per Ton.

HOLMSIDE GAS COALS are supplied to the largest Gas Companies in England and on the European Continent; London alone consuming about half the produce.

**SOUTH MOOR**

**PELTON GAS COALS.**

**Present Daily Produce available 3000 Tons**

Of equal quality to the "Holmside" Coal, and also very largely used by many Gas Companies at Home and Abroad.

Both descriptions are shipped at Tyne Docks, and Dunston Staiths, River Tyne, also at North and South Docks, Sunderland.

These Coals may be bought through the Principal Merchants in England, or direct from

**MR. MARK ARCHER,**

**HOLMSIDE & SOUTH MOOR OFFICES, NEWCASTLE-UPON-TYNE.**

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**PREPAYMENT ATTACHMENTS**

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Can undertake the Largest Contracts.

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Awarded HIGHEST MEDAL and DIPLOMA at the Newcastle-on-Tyne Royal Mining and Industrial Exhibition, 1887, for

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**TYNE**

**BOGHEAD CANNEL.**

Yield of Gas per ton . . . . 13,155 cub. ft.
Illuminating Power . . . . 38·22 candles.
Coke per ton . . . . . 1,301·83 lbs.

**EAST PONTOP GAS COAL.**

Yield of Gas per ton . . . . 10,500 cub. ft.
Illuminating Power . . . . 17·8 candles.
Coke . . . . . 70 per cent.

**SOUTH PELAW MAIN GAS COAL.**

Yield of Gas per ton . . . . 10,500 cub. ft.
Illuminating Power . . . . 16·3 candles.
Coke . . . . . 73·1 per cent.

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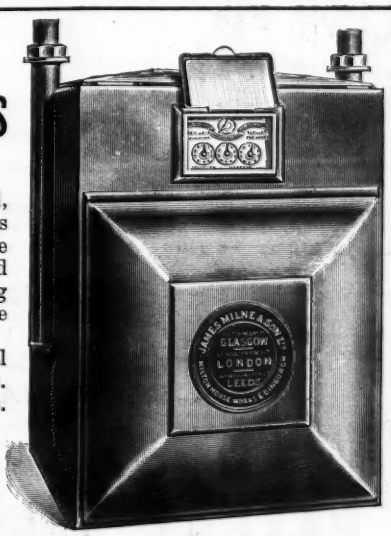
**WET & DRY GAS-METERS**

These Wet Meters are still preferred, in many cases, to Compensating Meters on account of the long time they can be left without re-watering; the improved construction and shape allowing a long range of water-line without affecting the registration.

Dry Meters of Special Charcoal Tinned Iron, with many Improvements. Extra Thick Tin Plate used throughout.

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SEVERAL THOUSANDS OF OUR SETTINGS IN SUCCESSFUL WORK.

*Plans, Estimates, and full Particulars for Complete or Partial Erection and Renewal*

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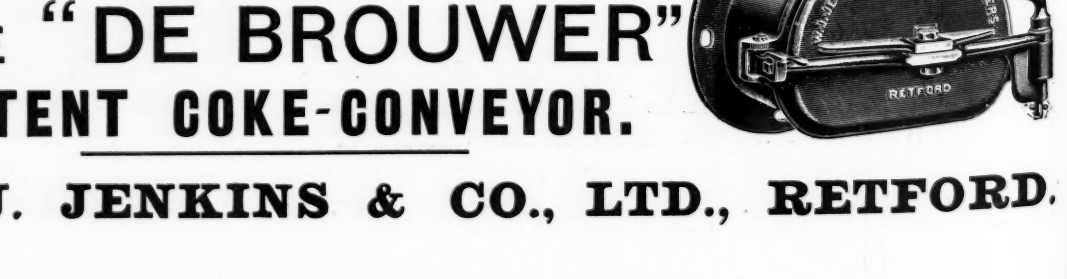

See next Week's Advertisement for Steam-Pumps, Tar and Liquor Pumps, &c.

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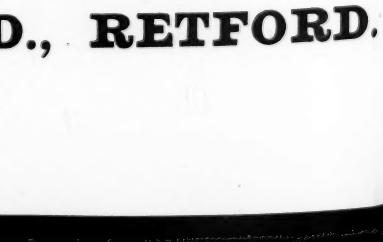
**WITH SELF-SEALING LIDS FOR HORIZONTAL AND INCLINED RETORTS.**

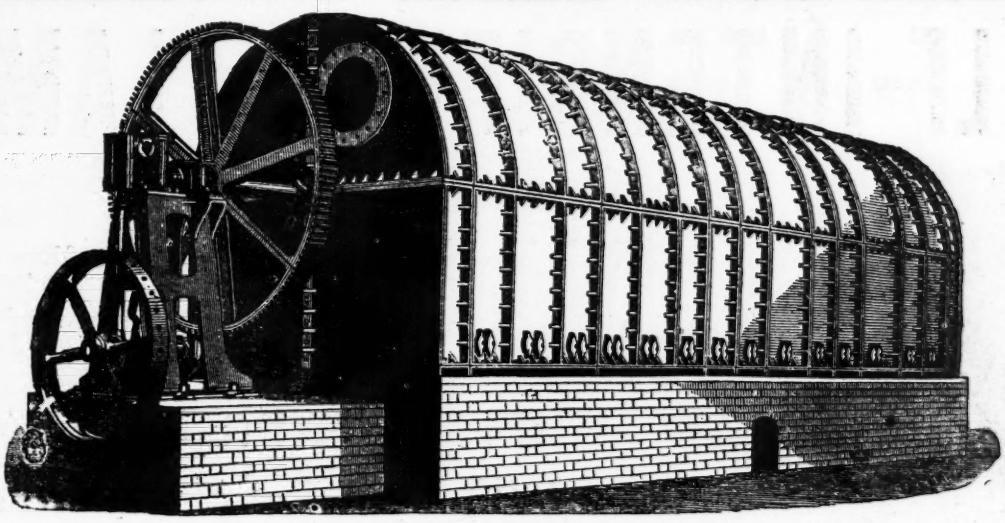
*SOLE MAKERS OF*

## THE "DE BROUWER" PATENT COKE-CONVEYOR.




**W. J. JENKINS & CO., LTD., RETFORD.**

# H. KIRKHAM'S PATENT "IMPERIAL" WASHER-SCRUBBER.



## TESTIMONIALS.

*The Dovor Gaslight Company,*
*Gas-Works, Buckland,*
*Dover, Feb.* 8, 1899.

H. KIRKHAM, Esq.,

Dear Sir,—Have now made further tests with the Washer fitted with your PATENT WASHING DEVICES, and have much pleasure in reporting that *the results were highly satisfactory*; also, I ascertained that the maximum results were obtained when the machine was working at three revolutions per minute. At this speed 13 to 14 gallons of water per ton of coal carbonized were converted into 10-oz. Ammoniacal Liquor, and at same time the Gas was free from Ammonia.

Should you wish further details, I will forward them.

I am, dear Sir, yours truly,
RAPHAEL HERRING, Engineer.

---

*The Dovor Gaslight Company,*
*Gas-Works, Buckland,*
*Dover, April* 4, 1900.

*Re* H. KIRKHAM'S PATENT WASHER.

Please note I have much pleasure in stating that one of the above Patent Washers, 1,000,000 cubic feet capacity per 24 hours, has now been in regular action day and night for about 18 months, and is still working to our entire satisfaction.

Six months ago I examined the interior, and then found the Scrolls clean and bright, due, in my opinion, to the flushing action of the fluid rushing from inside the Scrolls.

Also when passing its maximum quantity of gas it gives the minimum of pressure.

For further Particulars see my report to Mr. H. Kirkham, Feb. 8, 1899.

Yours truly,
RAPHAEL HERRING, Engineer.

---

*The Dovor Gaslight Company,*
*Gas-Works, Buckland,*
*Dover, Dec.* 29, 1900.

H. KIRKHAM, Esq.,

DEAR SIR,—Your Washer fitted with Patent Scroll Devices was put to work Nov. 9, 1898, and has been in regular use to this date.

I am sure you will be pleased to know that the excellent results we got when this was first started are still regularly obtained.

Yours truly,
RAPHAEL HERRING.

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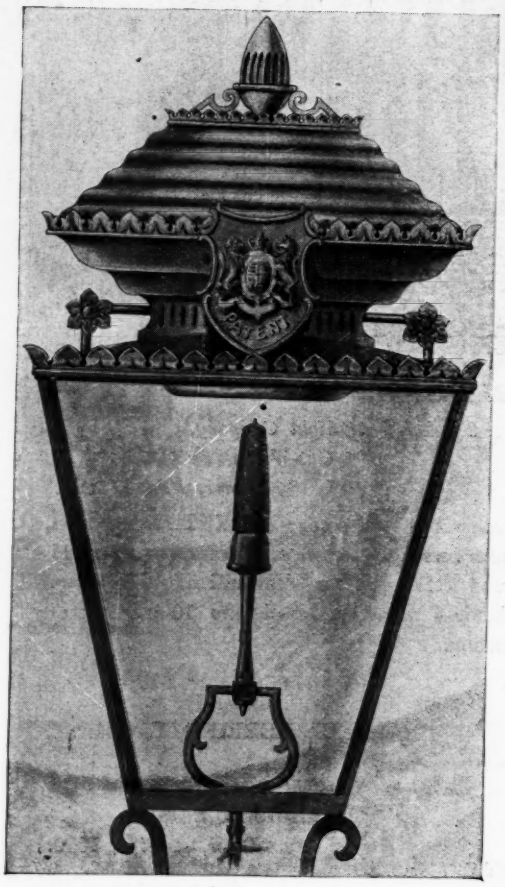
**EFFICIENCY GUARANTEED.**

**Estimates given for a complete set of Segments for One Wheel, or for refitting the whole number of Wheels in a Machine; also for Washer-Scrubbers complete.**

*Office:* 335, MANSION HOUSE CHAMBERS, QUEEN VICTORIA STREET, LONDON, E.C.

# SCOTT-SNELL
# SELF-INTENSIFYING LAMP.



SIZE NORMAL.

**Automatic Action.**

**No Complex Mechanism.**

**"Power" Free of Cost.**

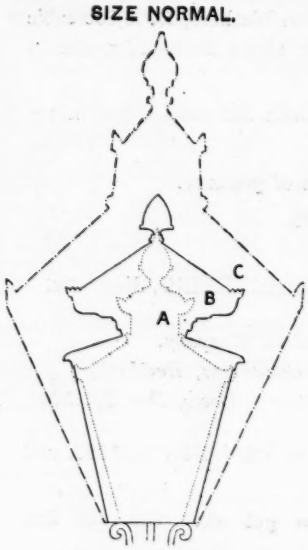
## INTENSIFIED LIGHT

**WITHOUT** Compressing Plant, Special Gas-Service, Water Bill, Gas-Engine or other Pumping Appliances, tearing up of Roadways, or interference with existing Service.

The **SCOTT-SNELL LAMP** may be set to give any pressure from **4** inches to **36** inches of Water; **8** inches to **10** inches is usually preferred.

**400**-*CANDLE POWER OBTAINED FROM A SINGLE BURNER.*

**Lanterns supplied with Single, Duplex, or Cluster of Burners.**




SCALE DIAGRAM.
A. Ordinary 16-inch Street Lamp.
B. Scott-Snell Self-Intensifying Lamp.
C. Ordinary Refuge Lamp.

## HIGH-PRESSURE LIGHTING HAS COME TO STAY.

Orders for Trial Lamps will, as far as possible, be executed in rotation.

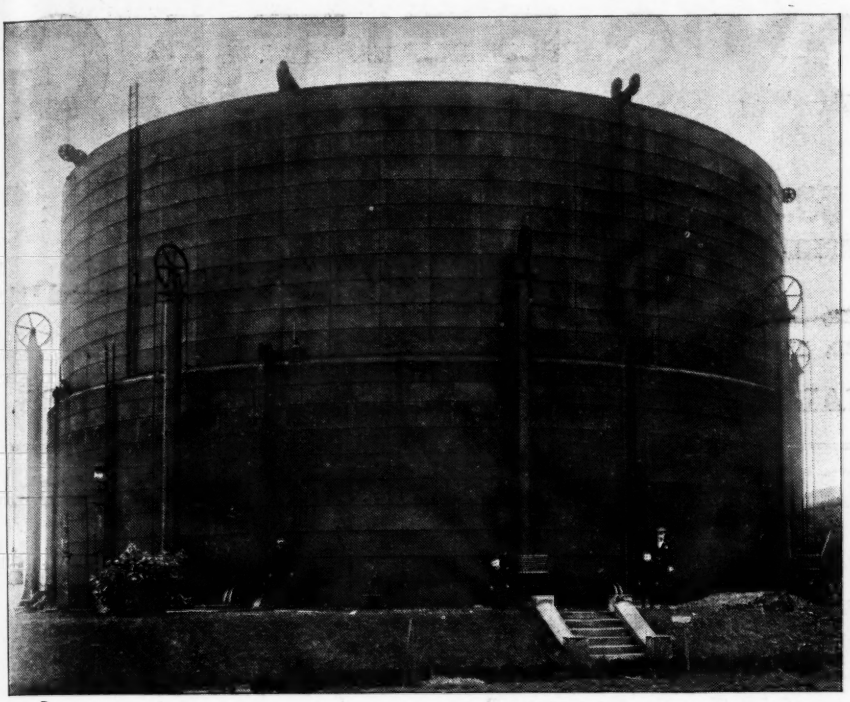
The Lamps are being made by Automatic Machinery, similar parts interchangeable, minimum of hand labour.

THE LAMPS MAY BE INSPECTED AT ANY TIME BY APPOINTMENT.

**THE SCOTT-SNELL SELF-INTENSIFYING GAS-LAMP COMPANY, LTD.,**

Telephone No. 559 Westminster. **53, Victoria Street,**

Works: 29, GILLINGHAM STREET, S.W. **WESTMINSTER, S.W.**



**INNER LIFT ADDED TO A SINGLE-LIFT GASHOLDER,**

80 ft. diameter by 24 ft. deep. Both Lifts Cable-Guided. Counter balance to Outer Lift on old Columns.

**KIRKCALDY GASLIGHT COMPANY.**

*(From a Photo.)*

PATENTEES AND MANUFACTURERS:—

# ASHMORE, BENSON, PEASE, & CO., LTD.,

## STOCKTON-ON-TEES.

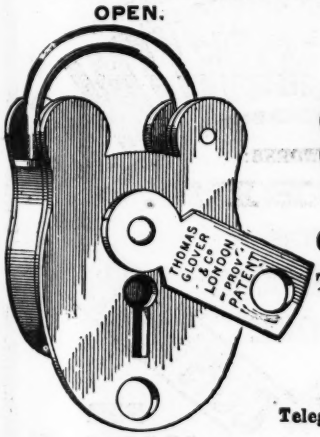
ESTABLISHED 1844. **ORIGINAL MAKERS.** ESTABLISHED 1844.

LONDON, 1851. NEW YORK, 1853. PARIS, 1855. LONDON, 1862. DUBLIN, 1865. PARIS, 1867.

THE SIX MEDALS AWARDED TO THOMAS GLOVER'S PATENT DRY GAS-METERS;

*The latter being the Highest Award for Dry Gas-Meters at the Paris Exhibition, 1867. Since then we have not Exhibited FOR PRIZES.*

OPEN.

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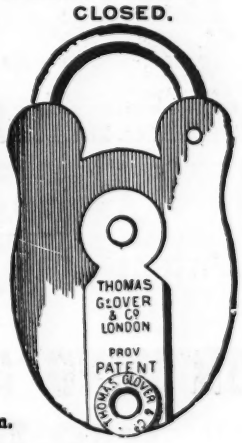


Telegraphic Address: "GOTHIC, LONDON." Telephone No. 725, Holborn.

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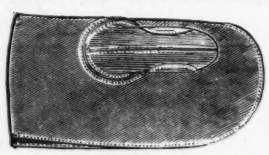

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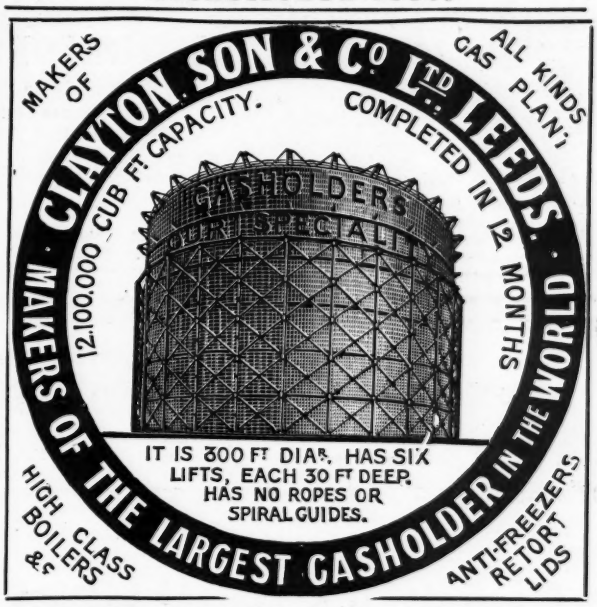
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